THE JOURNAL

OF THE

ANTHROPOLOGICAL INSTITUTE

OF

GREAT BRITAIN AND IRELAND.

FEBRUARY 9th, 1886.

FRANCIS GALTON, Esq., M.A., F.R.S., *President, in the Chair.*

The Minutes of the last meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

From H. H. PRINCE ROLAND BONAPARTE.—Note sur les récents Voyages du Dr. H. Ten Kate dans l'Amérique du Sud.

From the AUTHOR.—Mensuration des crânes des Grottes de Baye. Par P. Topinard.

—— Die Capacität und die drei Hauptdurchmesser der Schädelkapsel bei den verschiedenen Nationen. Von Hermann Welcker.

From the STATE BOARD OF HEALTH, &c., MASSACHUSETTS.—Sixth Annual Report. Supplement, 1884.

From the GOVERNMENT OF NEW ZEALAND.—Statistics of the Colony of New Zealand for the year 1884.

From the DEUTSCHE GESELLSCHAFT FÜR ANTHROPOLOGIE.—Correspondenz Blatt, 1885. Nos. 11, 12.

From the BERLIN GESELLSCHAFT FÜR ANTHROPOLOGIE.—Zeitschrift für Ethnologie. 1885. Heft 5.

From the ARCHÆOLOGICAL SOCIETY OF AGRAM.—Viestnik hrvatskoga Arkeologičkoga Družtva. Godina VIII. Br. 1.

From the ACADEMY.—Atti della Reale Accademia dei Lincei. Vol. I, Fas. 28., Vol. II, Fas. 1.

From the ASSOCIATION.—The Journal of the Royal Historical and Archæological Association of Ireland. No. 60.

From the CLUB.—Proceedings of the Berwickshire Naturalists' Club. Vol. X, No. 3.
From the SOCIETY.—Proceedings and Transactions of the Royal Society of Canada for the year 1884. Vol. II.
—— Proceedings of the Royal Geographical Society, 1886. No. 2.
—— Journal of the Royal Geological Society of Ireland. Vol. VI, Part 3. New Series.
—— Transactions of the Asiatic Society of Japan. Vol. XIII, Part 2.
—— Journal of the Society of Arts. Nos. 1730–1733.
—— Bulletin de la Société Impériale des Naturalistes de Moscou, 1884. No. 4.
—— VII. Jahresbericht der Geographischen Gesellschaft von Bern, 1884-1885.
From the EDITOR.—Nature. Nos. 846–849.
—— Science. Nos. 152–155.
—— Revue d'Anthropologie, 1886. No. 1.
—— Revue d'Ethnographie, 1885. No. 5.
—— L'Homme. Nos. 23, 24.
—— Matériaux pour l'Histoire de l'Homme, 1886. Jan.

The election of the following new Members was announced:—

Professor OTIS T. MASON, of the Smithsonian Institution, Washington; Professor J. RANKE, of Munich; Dr. L. MANOUVRIER, of Paris; and Professor J. KOLLMANN, of Basel, as Honorary Members; and the Rev. W. BIRKS, of Wanstead Villa, Villier's Road, Southsea; J. G. BLUMER, Esq., of Satis House, Darlington; F. H. COLLINS, Esq., F.L.S., of Churchfield, Edgbaston, Birmingham; I. SPIELMAN, Esq., of 3, Westbourne Crescent; and T. L. WALL, Esq., of Leyland, Preston, as Ordinary Members.

Mr. HORACE DARWIN exhibited several Anthropometric Instruments made by the Cambridge Scientific Instrument Company.

M. COLLIN, of Paris, exhibited a Traveller's Box of Anthropometric Instruments.

Professor A. MACALISTER, F.R.S., exhibited a skull from an ancient burying ground in Kamtchatka.

The following Paper was read by the President:—

On RECENT DESIGNS *for* ANTHROPOMETRIC INSTRUMENTS.
By FRANCIS GALTON, F.R.S., President.

IT is rather more than a year since I submitted, for criticism and discussion, the instruments that I employed in my temporary

anthropometric laboratory at the International Health Exhibition, South Kensington, in 1884. Since then, further experience of their use, and the results of your discussion of them, have led to modifications and new designs. These I again desire to submit to your helpful criticism. They are made by the Scientific Instrument Company in Cambridge, whose two able directors, Mr. Horace Darwin and Mr. Dew Smith, have kindly acted as members of the small committee who superintended the measurements made with my instruments during the past year at Cambridge. They are therefore well qualified to design and carry out improvements in them. The other instruments on the table are those recommended by M. Topinard, Professor of Anthropology in Paris, for the use of travellers, and described by him in his Anthropométrie Générale. They are very ingeniously made and packed into a portable box, but with the exception of a dynamometer to test the strength of squeeze, they refer wholly to linear measurements of the body and its parts.

I have received numerous letters concerning the establishment of anthropometric laboratories at various places, and on the addition to laboratories that already exist, of apparatus to measure various faculties. A frequent desire is also expressed for instruments and instructions to measure the head. It is to these points—measurements of the faculties and measurements of the head—that I principally desire to call your attention now.

First of all, let us consider the *cui bono* of making any measurements at all. The chief object of them, as it seems to me, is to define the individual or the race, and to show in what way, and to what extent, he or it differs from others. So far as the individual is concerned, measurements teach him to know his own powers at any given time. The second important object is to keep watch over the development during the period of growth, and to give timely warning if it does not proceed normally. Just as the examinations in books, with which every student is now only too familiar, test the amount and progress of his intellectual acquirements, so these other examinations test his strength and swiftness, his keenness of sight, hearing, and touch; his colour sense, his power of distinguishing slight differences in musical notes, his quickness of response to stimulus, and not a few other elementary psychical facts.

The sort of letters that I receive may be best shown by examples. One that reached me about six weeks ago came from a Japanese professor in the University of Tokio, who had been educated and taken his degree at Cambridge, stating that his Japanese students had subscribed a sum of £36 for the outfit of an anthropometric laboratory, and he asked me to order such

instruments as I thought most suitable. The list that he enclosed of the desired objects of measurement, contained those of which I have just spoken.

Professor Giuseppe Sergi, of the University of Rome, writes to say that he desires to add to his anthropological cabinet a specimen set of instruments for use in schools. He enclosed a pamphlet in which his views on their utility are set forth, and desired me to select a list for him.

M. Topinard, professor of anthropology in Paris, whose experience of the art of measuring the linear dimensions of the living human body, and those of the skull and other bones, is unsurpassed, writes to me to the following effect upon what I have called the measurement of faculties:

> I have written nothing as yet concerning physiological instructions to travellers, awaiting a convenient moment for doing so. I am disposed to take directly your system, and will ask to have all your apparatus sent to me. We possess no samples of colours for hair and eyes beyond the polychromatic table of Broca, which the Anthropological Institute employs, but I am about to undertake new work of this kind, and intend shortly to have some samples made; but not many of them, probably five for eyes and five for hair. My present difficulty is to select the exact shades and tints; if you have yourself made any such sets, I should be much obliged if you would let me have one.

I have also very lately received letters from two gentlemen who have just joined our institute, one of whom, Mr. Spielman, is already commencing a series of observations on a large scale, and both of whom are establishing anthropometric laboratories.

It is therefore obvious that a decision cannot be delayed as to the best instruments procurable for the above-mentioned purposes, in respect to facility of use, accuracy, portability, and cheapness. There is no finality in any design; I hope we shall always go on improving; but what is requisite now is to find the most satisfactory design that already exists or can at once be suggested, and to recommend its use until it shall be superseded by something distinctly better.

I will first ask your attention to the measurement of the head. Its object is to show, indirectly, how much and up to what age the brain continues to grow in bulk in different individuals, especially with a view of comparing the uneducated classes with those who are educated. It is well known that the size of the caps worn by university students much exceed that of the uneducated population, and it is therefore a matter of much interest to learn both generally and individually at what age the growth of the brain comes to a standstill under different circumstances. Unfortunately the measurement in question is difficult

to make with completeness. Craniologists, who are able freely to manipulate a skull, and have no trouble about varying thickness of skin and density of hair, and who see all the markings of the skull, have been long in coming to a general opinion, even if that is already reached, as to the best way of measuring it. Much less is it to be hoped that any general consensus will be arrived at soon as to the best way of measuring the living head. The maximum breadth of the head is easily taken by calipers or by sliding bars, if they are furnished with blunt teeth like a comb, in order to penetrate the hair and reach the skin. The maximum length of the head is also easily to be taken if we start from the glabella (the point between the eyebrows) or from the smooth spot above it. Probably it would be thought worth while to make both measurements. That from the glabella alone seems objectionable, because the frontal sinus grows rapidly in early adult life, and so far as it does this, a measurement that includes it would give an erroneous idea of the contemporary growth of the brain. The measurement of the height of the head is the great difficulty. It has to be taken at right angles to some very clearly defined plane of reference; and the question is, what plane of reference should be selected? The instrument I have used was made by Mr. H. Darwin and lies upon the table. It takes measurements from the plane that passes through two pairs of symmetrical points, namely, the two earholes and the upper and inner edges of the orbits, the latter affording an excellent catching place to hold a slight projection at the bottom of the instrument, without any risk of hurting the eyeball. The earholes are less satisfactory. It is a question whether a better plane of reference might not be found in that which passes through the upper edges of the orbits as before, and through the occipital tuber (or the inion), and to measure the height of the head by a perpendicular to that plane which crosses the earhole, or the middle of the tragus (the small portion of the external ear which covers the earhole as with a flap).

On these points I hope that the eminent craniologists present will favour me with their opinions and advice.

[The subject was subsequently discussed by Professors Flower, Macalister, and Thane, and by Dr. Garson, who all agreed that a plane of reference passing through the *lower* and outer edges of the orbits and the earholes was a good one, if the instrument was pressed firmly down against the edges of the orbit, by a band under the chin or otherwise. Mr. H. Darwin would alter the existing instrument so as to adapt it for this purpose. It was also agreed that the occipital tuber was not a good point of reference. —F. G.]

Standards of colour for eyes and hair.—Printed tints, like those of Broca and of Chevreuil, fade, and it is very difficult to compare the colour of hair with any flat tint. I have suggested the use of glass in small discs for comparison with eyes, and the same glass spun by a glass-blower for comparison with hair. Mr. H. Darwin is preparing specimens of these.

Dynamometer.—The common dynamometer for squeeze of hand is untrustworthy, because the maximum power of the squeeze much depends on the size of the object, at the moment of maximum strain, being convenient to the grip. In the ordinary instrument a strong man soon brings the handles so nearly together that his maximum strain is exerted very disadvantageously to his muscles. Mr. H. Darwin has devised a new instrument to remedy this, but it is not completed.

Sight.—I lay on the table the pattern of the instrument I used for testing acuteness of sight, but shall not say anything now about it, as I understand that it has been criticised at Cambridge, and I hope that those objections will be re-stated here, and so far as possible remedied.

Last spring the interesting question of the relative acuteness of sight among civilised and uncivilised people was forcibly brought forward by Mr. Brudenell Carter, and it was hoped that some very simple tests, such as travellers might successfully apply to wholly uneducated and suspicious barbarians, could be devised. A small committee of the Institute, including Mr. Brudenell Carter, considered the question on several occasions, but it was not found at that time possible to frame sufficiently simple tests that should cover all the points in which the total efficiency of the sight of a savage might be deemed to depend. For my own part, I am prepared to conform to the adage of "a half-loaf being better than no bread," and to content myself provisionally with an inquiry into the relative facility with which a single black dot near the corner of a square white card could be seen by men of various races, the position of the dot and the size both of the dot and of the card being specified. The test would be to expose the card as it rested on any one of its sides, and to require the observer to indicate in which of its corners the dot lay. Sometimes, as a so-called "puzzle case," the blank back of the card would be exposed. This test could be easily applied, and it would at all events tell us something; though it would not fully solve the question whether the efficiency of sight among savages in detecting distant objects was or was not generally superior to that of the civilized traveller who tested the card himself at the same time and under the same circumstances.

Colour-sense.—Mr. H. Darwin is engaged on a simple instru-

ment for testing the colour-sense. A singularly instructive account of a vast number of varied experiments made by another apparatus has just been published in *Brain*, and will, I understand, appear with very full details in *Mind*, by Dr. Cattell, a young American, who is now assistant in Professor Wandt's laboratory at Leipzig. The apparatus is in principle what photographers would call a drop shutter; its object is to give a very brief but measurable exposure of a colour of one or more letters, or numerals, or of a word. The instrument is applied to many purposes; that which now concerns us is the colour-sense. It appears that every object, whatever may be its colour, seems grey when looked at for a time a little less than one-thousandth of a second. When the exposure is prolonged the sense of colour begins to be excited, but it requires a longer exposure to see some colours than others. Measured in ten-thousandth parts of a second the averages are as follows:— Orange requires an exposure of 8; yellow of 10; blue of 12; red of 13; green of 14; and violet of 23, or nearly three times as much as orange. A very large number of experiments were made on seven persons, and in each case the figures were constant, but the individual differences were large. I find, in reducing Dr. Cattell's figures, that the relative sensitivity for red and violet also differed considerably among these 7 persons, and to the following extent: 1 case in which it was 14; 3 cases of 16; 1 of 17; 1 of 20; and 1 in which it was 23. Thus out of seven persons, one was relatively twice as sensitive to violet, as compared with red, as another. This instrument might, therefore, perhaps serve as a test of colour-sense, but it has physical adaptations as well. In the first place, it shows how many letters, numerals, or lines can be grasped by consciousness during a brief exposure, and this proves to be a very variable gift, certainly in some way connected with the general grasp of the mind, but this has to be experimented on further. In the second place, it seems that this instrument may perhaps afford a much desired measure of general nerve fatigue—it certainly affords one of eye fatigue, as the exposure has to be increased considerably after the eye becomes wearied. It is very probable that Dr. Cattell's instrument, in perhaps its rudest form, without an electro magnet, will be found of much future anthropometric service for general use.

Sound.—I wrote to Dr. Cattell, asking him what good instruments existed, to his knowledge, in Germany or elsewhere for giving a sound of standard loudness. He replies:—

As far as I know, no sound of standard loudness has been agreed upon. When I wished to specify the sound used in certain experiments, I let a ball of a given weight fall from a given

height, the material of the ball and the nature of the surface on which it fell being also given. The loudness of the sound in this case is not in proportion to the height from which it fell, multiplied into the weight of the ball, and into a constant depending on the material, as has been assumed. Vierordt (*Zeitsch. f. Biologie*, 1878) gave the formula $i = p\sqrt{h}$; Overbeck (*Wiedermann's Annalen XIII*) $i = p\,h^{\cdot 641}$. New experiments from our laboratory are about to be published.

Mr. H. Darwin has designed an instrument emitting a faint sound, suitable for testing the acuteness of hearing.

Distinction of Notes.—Dr. Cattell says:—

We have in the laboratory two excellent pieces of apparatus for testing the power of distinguishing notes. The one is an organ arrangement, which gives the notes at intervals of four vibrations from 32 to 1024. This is made by Appunn in Hanau a/M. and each octave costs, I think, about £20. The other apparatus is a set of tuning forks made by König, in Paris. Pairs of tuning forks are taken, one always gives the same note, the other (by means of weights) can be so regulated as to give a note a little lower or higher. Experiments on this subject are being made by three groups of students, and the results will be published (in Wandt's *Studien*) during the year. In one case, memory of notes is being especially investigated.

Mr. H. Darwin will submit a much less costly instrument than either of these, for the purpose of ordinary anthropometry.

I will now call upon him to explain the instruments in order, and will ask you to discuss each in turn.

Discussion.

Mr. BRUDENELL CARTER said he feared his objection to the proposed test for sight was a fundamental one. He regarded it not at all as a test of acuteness of vision, which was the thing desired, but only as a test of the acuteness of perception of slight differences in the intensity of light. The perceptive surface of the retina might be described as a mosaic composed of hexagonal elements, and he would assume, for the purpose of illustration, that the image of the entire card covered six of these elements. In that case, one retinal element would receive the image of one-sixth of the card. If the superficial area of the spot were one-twentieth of that of one-sixth part of the card, one of the six retinal elements would receive an image one-twentieth part less luminous than the images received by the other five elements; and thus, although the spot itself might not become an object of vision, its position on the card would be revealed, supposing that the retina was sufficiently sensitive to small differences of light for a difference of one-twentieth between adjacent parts of the whole image to be perceived. He contended that nothing was an accurate

test of acuteness of vision, unless it called upon the person tested to see the separateness of two or more objects, such as spots, which were separated from each other by intervals equal to their own diameters. The separateness of such objects did not become visible until their retinal images were so large that the image of the interval between them completely covered a single retinal element. Until this condition was fulfilled, two or more dots, although their position might be discoverable as a matter of luminosity, as in the familiar case of double stars, discoverable as single ones by the naked eye, could not be said to be either objects or tests of vision, properly so called. He hoped that the labours of the Committee on the subject were not concluded, and that they would be able to arrive at some simple and practical test composed of two or more dots or other objects.

Exhibition *of* Anthropometric Instruments.

By Horace Darwin, Esq., M.A.

Mr. Horace Darwin apologised for the incomplete state of the apparatus exhibited. He first showed an instrument for testing the keenness in distinguishing small differences in the pitch of a musical note. An organ pipe giving about the middle C was blown by a bellows. Its pitch could be altered by a known amount by changing its length. Constancy of air pressure is of considerable importance, and could easily be obtained with a more perfect bellows.

The next instrument shown was a chronograph made according to the design of the President, Mr. F. Galton, for measuring the quickness with which a person can press a lever after a sound signal is given. A wooden rod is supported at its upper end by a detent, and can be released at will. The rod then falls freely in space passing through a hole in a fixed diaphragm. A weight in the form of a ring, larger than the hole in the diaphragm, rests on a collar near the top of the rod. Thus, after rod and weight together have fallen a definite distance, the weight is caught by the diaphragm and makes the signal sound, while the rod still continues to fall. On hearing the signal sound the person to be tested presses down a lever, thereby releasing a spring clamp which grips the falling rod firmly. The interval of time between the signal sound and this operation is measured by the space the rod has fallen through, and is read at once in hundredths of a second from graduations on the rod itself.

The third instrument shown—designed at the suggestion of the President—was for measuring the relative sensitiveness of the eye to various colours in different persons. An object, such as a card, on which numbers are printed in diamond type, is fixed

against the side of a box and is viewed through a small hole in the opposite side of the box. The various colours are obtained by placing pieces of coloured glass in front of the hole. The diffused light falling on the card passes through an adjustable aperture and through a translucent screen at the end of the box The illumination of the card can be varied by the adjustable aperture, and is proportional to its area.

To use the instrument, the person looks at the card through a piece of coloured glass, moves the adjustment till he can only just read the numbers, and notes the area from a scale. He does the same with any other coloured glasses. Now if daylight be used for illuminating the apparatus, the numbers obtained from the scale obviously depend on the brightness of the day. It is therefore necessary either to use a standard illumination, or if daylight be used, to reduce the numbers to ratios. In this case it would be convenient to consider the observation with one particular colour as 100 and to reduce all other observations so as to maintain the original ratio.

The following instruments of Mr. Galton's design were also exhibited:

Apparatus for testing the judgment of the eye in estimating squareness, also for testing the power of dividing a line into two equal parts.

Head-spanners, for measuring length and breadth of the head and the height of the head above the plane passing through the holes in the ears and the ridge of the frontal bone above the eyes, to which reference has already been made.

Discussion.

Mr. BRUDENELL CARTER inquired whether Mr. Darwin was acquainted with Professor Förster's instrument for the purpose of testing the acuteness of light perception. It consisted of a box, the interior of which contained a series of broad stripes, alternately black and white, as objects, and was illuminated either by lamplight or daylight through a square opening which could be increased in area from one to sixteen hundred square millimetres. This instrument was useful in ascertaining the soundness or otherwise of the retina in cases in which vision was too much impaired to be tested in the ordinary way.

Mr. JOSEPH JACOBS remarked that in all experiments with instruments for measuring sensation, variations are likely to arise owing to subjective differences of nerve fatigue, &c., in the subject at different times. Thus the same man might appear to have a limit of clear vision at 21 inches on one occasion, and at 24 at another. No improvements in instruments could obviate this source of error, which could be only eliminated in each individual by taking the average of a series of observations between different individuals by taking the observations under the same conditions. He would

observe that the instrument for measuring quickness of hearing did not directly achieve its purpose, for a certain appreciable time ("reaction time" the physiologists call it) elapsed between the hearing and the pressing down of the lever which arrested the fall of the rod. There was variation in "reaction time" as well as in quickness of hearing. Mr. Galton's instrument was only intended to measure the sum of these variables. To ascertain the quickness of hearing the "reaction time," to be ascertained by the method of Exner or other means, would have to be subtracted.

Dr. RAYNER said that he had an instrument for taking measurements of the skull and head, which, in addition to the graduated horizontal bar, with two sliding graduated vertical limbs, had on each of these last a smooth pointed traveller projecting one inch and reversible, so that interior measurements could be taken.

Professor FLOWER, Mr. C. ROBERTS, and Professor THANE, also took part in the discussion.

The following Paper was then read by the author:

The CEPHALIC INDEX.

By J. G. GARSON, M.D., F.Z.S., M.A.I., Mem. Corresp. Etm. Soc. d'Anthrop. de Paris. Lecturer on Comparative Anatomy, Charing Cross Hospital; Royal College of Surgeons of England.

THE cephalic index expresses in percentage the relative proportion which the breadth of the skull bears to the length, and is thus an exact method of indicating the general form of the skull in those two relations. Depending as it does on the measurement of length and breadth, it is at once evident that if a skull is to give the same index in the hands of different observers these diameters must always be measured in exactly the same way. Skulls being termed dolichocephalic, mesaticephalic or brachycephalic according as the cephalic index is low, medium, or high, it is likewise necessary, in order that these terms may always indicate the same form of skull, that each should have a certain fixed limit, otherwise a skull which is dolichocephalic according to one nomenclature may be mesaticephalic by another system, and *vice versâ*. Till lately great differences in measuring the length and breadth, and of classifying the cephalic index have existed among anthropologists. With the advancement of anthropological science these differences are disappearing, and the time has come when we may hope to have an uniform system of measurement and of nomenclature. To obtain this great efforts are being made by

leading anthropologists in France and Germany, and it appears desirable that we in this country should do our best to assist them. For this purpose the Council of this Institute requested me to ascertain the views of anatomists in this country and to communicate with Prof. Topinard of Paris on the subject. As a result of these communications we have drafted a scheme of measurement and nomenclature which we have every reason to believe will be generally acceptable. It has been arrived at by mutual agreement and concession, and cannot be said therefore to be the system of one person or nation, as modifications have been proposed by one side and by the other, and the methods and divisions of all anthropologists have been carefully considered in order to produce a result which would harmonise with the ideas of anthropologists generally. The questions which have had to be considered in relation to the subject are three in number, viz.: 1st, the standard of measurement to be used; 2nd, the method of measuring the length and breadth; and 3rd, the division and nomenclature of the index. The draft agreement we have arrived at on each of these I shall now proceed to explain and submit to your criticism.

In all linear measurements the metric system is to be adopted. This is now almost universally done by anthropologists as well as other scientists in this country. To secure uniformity, however, it was necessary to indicate our adherence to the international standard of linear measure, of all departments of science. *The cephalic index to be estimated from the measurements of maximum length and breadth of the skull. The maximum length to be measured from the most prominent point on the glabella in front to the most prominent point of the occiput behind, in the mesial plane. The maximum breadth to be measured between the most prominent points on the lateral walls of the skull, wherever these points may be situated, except on the mastoid processes, the points being in the same horizontal plane and at right angles to the length-axis.*

The measurements of length and breadth have of late years been made for the most part as above defined in this country as well as by those who have followed Broca's system and the Frankfurt agreement. Several anthropologists in England used, however, to calculate the cephalic index from the length measurement between the ophryon in front and the most prominent point on the occiput behind. When calculated from this measurement of length the index is higher in most skulls, particularly those of males, than when the glabella is included. This proceeding has, I think, now been abandoned.

In measuring the maximum length care must be taken that the length axis is in the middle plane. It sometimes happens that

the two lateral halves of a skull are perceptibly unsymmetrical, and that the greatest length is situated not in the middle line but to one or other side of it, the actual maximum length of such a skull is not the maximum *mesial* length and consequently is not to be used in calculating the cephalic index, which in all cases must be calculated from the latter. In measuring the maximum breadth some care and practice are required to hold the calipers in the proper position while finding the points of maximum width—that is, transversely to the length-axis and also at right angles horizontally to the mesial plane of the skull.

The cephalic index to be divided into groups each containing five units. Seven of these groups to be named and to have the following limits. Mesaticephalic from 75 *up to* 80, *Dolichocephalic from* 70 *up to* 75, *Brachycephalic from* 80 *up to* 85, *Hyperdolichocephalic from* 65 *up to* 70, *Hyperbrachycephalic from* 85 *up to* 90, *Ultradolichocephalic from* 60 *up to* 65, *Ultrabrachycephalic from* 90 *up to* 95.

NOTE 1.—In cases where the cephalic index is beyond these groups, others, consisting of five units, may be formed at each or either end of the named series.

NOTE 2.—The termination of each group is exclusive of the number indicating its highest limits; thus the termination of the mesaticephalic group is 79·99, the brachycephalic group includes skulls with an index of 80.

Anatomists agree in regarding 77 as the mean cephalic index of the human skull, and both in England and Germany the mesaticephalic group has been defined for some years past as ranging from 75-80. More recently anthropologists in France have, through the exertions of Prof. Topinard adopted these limits also.

This generally accepted central group we propose to take as a convenient starting point for other divisions of the cephalic index. The practical convenience of having all of these groups of the same dimensions—that is, including the same number of units—recommended itself so strongly that there was no doubt as to the advisability of adopting this principle and applying it to all classes into which it might be considered necessary to divide the index. The next question which naturally had to be considered was the number of divisions it was desirable to make. In previous classifications the number has varied from three to five. For merely classifying the skulls of any race according to the average cephalic index, five divisions would be amply sufficient to indicate the general form of the skull in the race as a whole. But several anthropologists have shown that more minute study of the cephalic index is necessary, as important information can be derived from analyses of its variations in each particular

race as is done by the system of seriation[1]. This indicated to us that in our classification we should adopt, if possible, such a system as would admit of a combination of the synthetical and analytical methods of examination. For this purpose five divisions, each including five units, is inadequate, as anthropologists who have had much to do with very dolichocephalic or brachycephalic skulls can testify. The quinary divisions require to be extended as far in each direction as there are indices to classify. Normal skulls with indices as low as 53 and as high as 98 have been recorded, so that to include these extreme forms the divisions of the index would require to extend from 50 to 100. As skulls with indices below 60 and above 95 are very rare, it has been considered unnecessary to give distinctive names to any groups beyond these limits. Analyses of the indices of skulls outside these groups may be efficiently made by stating the limits of the quinary division in which they come, or the number of the group above or below the central one. The nomenclature applied to the seven groups named is simple and not likely to lead to confusion, the first group below and above the mesaticephalic being termed dolichocephalic and brachycephalic respectively. The second group on each side has the prefix *Hyper* added to the words dolichocephalic and brachycephalic which will be sufficient to indicate their respective positions, while the last-named or third group on either side is called *ultra*dolichocephalic and *ultra*brachycephalic respectively. The following is a list of these groups and their limits arranged in tabular form:—

TABLE I.

3. Ultra-dolichocephalic	....	60 to 65 excl. *i.e.* 64·99
2. Hyper-dolichocephalic	....	65 to 70 excl. „ 69·99
1. Dolichocephalic	....	70 to 75 excl. „ 74·99
0 Mesaticephalic	....	75 to 80 excl. „ 79·99
1. Brachycephalic	....	80 to 85 excl. „ 84·99
2. Hyper-brachycephalic	....	85 to 90 excl. „ 89·99
3. Ultra-brachycephalic	....	90 to 95 excl. „ 94·99

These divisions which we purpose to adopt correspond very closely with the divisions of the index which have been made recently by anthropologists in Germany, particularly those of Professor Ranke, the chief difference being that in the German divisions the dolichocephalic indices are not subdivided into groups as we have done, all skulls with indices below 75 being classed as dolichocephalic. I think the probable explanation of this is that most of those who have taken an active part in arranging the nomenclature of the cephalic index in Germany have had chiefly to deal with brachycephalic skulls, consequently

[1] See Table II.

while recognising the importance of having several groups for these skulls, they have not been brought face to face with the necessity of having a corresponding number of groups for dolichocephalic skulls. The anthropological collections of England and France contain large numbers of skulls of this latter form as well as of the brachycephalic type, consequently we see more forcibly, perhaps, the necessity of having symmetrical groups on both sides of the central divisions, not only for analytical examination, but also for averages. I cannot adduce better evidence of this than by inserting the following table drawn up from statistics given in Professor Topinard's *Elements d'Anthropologie Générale.* The table will also indicate the method of analysis of the variations of the cephalic index, the frequency of skulls of each race in the several groups being expressed in percentage.

TABLE II.

	66 Long Barrow Skulls.	74 Round Barrow Skulls.	1000 Parisians.	1000 Bavarians.	100 Eskimo.
Ultradolichocephalic	3·	—	—	—	4·
Hyperdolichocephalic	28·8	—	·2	—	35·0
Dolichocephalic..	62·2	4·	13·7	·8	51·
Mesaticephalic	6·	31·2	41·2	16·3	10·
Brachycephalic	—	41·9	35·7	52·7	—
Hyperbrachycephalic	—	22·9	9·8	26·9	—
Ultrabrachycephalic	—	—	1·3	3·1	—
95–100 excl.	—	—	·1	·2	—

As the principle of dividing the index into equal groups, including five units, seems to have been adopted by Professor Ranke in his system of nomenclature, and also in that of the Frankfort Agreement, we are led to hope that our fellow-workers in Germany may see the advantage to be derived uniting with us in establishing an international system of division and nomenclature of the cephalic index. At the desire of the Council of this Institute I have forwarded to Professor Ranke, as General Secretary of the German Anthropological Society, a copy of this draft scheme for the consideration of the Society.

Discussion.

Professor FLOWER made the following observations :—

To the first principle laid down in the scheme submitted by Dr. Garson, that of using the metric system, I have always adhered.

The third also coincides as far as the most important divisions are concerned, *i.e.*, boundaries of the mesaticephalic, dolichocephalic, and brachycephalic groups, with that advocated and adopted

in my catalogue of the crania in the museum of the Royal College of Surgeons, and I am quite willing to adopt the further divisions of the two latter now suggested, in order to distinguish extreme forms of variation from the average.

As to the measure of length, if the glabella is adopted, as it seems to be, by the great majority of French and German craniologists, it will be necessary for the sake of uniformity to join, although I do so under protest. I have hitherto followed Rolleston and Barnard Davis, in taking the length from the ophryon in front, excluding the glabella, an accidental prominence caused by thickness of bone and development of air cells within, and having no relation to the true form of the cranium. All agree, when taking the so-called maximum breadth, to neglect the mastoid processes and supra-mastoid ridges, if they should be developed, as occasionally happens, so largely as to pass beyond the breadth of the cranium proper. To be consistent, the glabella, a prominence of exactly similar character, should be also excluded. Its inclusion gives a false appearance of greater length to certain races, as the Australians, and to male skulls over females, to old skulls over young ones, which does not exist in the real form of the brain cavity. It is urged that there is a difficulty in fixing the ophryon as an exact point to measure from, and this undoubtedly occurs in a few skulls, but these are quite exceptional. However, it is a case in which uniformity is so desirable—as upon this measurement the most important index depends—that the minority must, I suppose, yield to the majority.

Professor THANE said he had no hesitation in accepting in principle the three points submitted to the meeting by Dr. Garson, especially as they had received the approval of such eminent and representative anthropologists as Professors Topinard and Ranke. He considered that the *ophryo-occipital* length was preferable to the *glabello-occipital* for the calculation of the breadth-index, since the latter was a compound of two factors, both of which were variable, viz., the length of the cranial box and the prominence of the glabella, and the comparison of the form of the cranium in different individuals and races was rendered simpler and more correct if the glabellar prominence were excluded. On the other hand, it is stated by observers of much experience that at times practical difficulty and uncertainty are met with in obtaining the ophryo-occipital length, and in view of this circumstance and of the fact that the glabello-occipital length is universally adopted in France and Germany, as well as by many workers in this country, it seems that uniformity can only be attained by our accepting the standard proposed. With regard to the mode of classification, the most important point is the determination of the mesaticephalic group, and then the question of the number and range of the other groups becomes one of expediency only. As to the position of the middle group, there is now a general consensus of opinion among anthropologists, and an uniform division into groups of five units each is obviously convenient and appropriate. It is desirable, however,

that better and more distinctive terms should be found for the extreme groups.

Dr. BEDDOE heartily approved of the lines on which the proposed agreement was drawn, and particularly of the application of the leading divisional names (dolichocephalic and brachycephalic) to the numbers 70–75 and 80–85 respectively, and the abolition of such terms as sub-brachycephalic. He pointed out that Dr. Garson's scheme confined the unmanageably long words to the rarest cases, which was really a practical advantage.

Professor MACALISTER also joined in the discussion.

Sir WILLIAM TURNER, who could not be present, sent the following observations:—

I have read the paper "On the Cephalic Index," by Dr. Garson. With much of what he has written I agree, as it is in conformity with what I have been in the habit of doing in the craniometric researches which I have conducted; as may be seen in my Report on the Human Crania collected during the voyage of H.M.S. "Challenger" (*Zool. Chall. Exp.*, Part xxix, 1884). As regards his proposed division of crania into seven groups, each including five units, based on differences in the cephalic index, I would state that, in my opinion, any such proposed grouping ought to be qualified by the remark, that the divisions and the numbers selected as their respective limits are purely arbitrary. I would further state that if assent is to be asked for from craniologists to the propositions made in the paper, it should be accompanied by the proviso that this is only expected to be given so long as the subject retains its present aspect, but that each investigator is to hold himself free to develop the subject in such directions as may seem to him to be most likely to yield fruitful results.

[The following paper, read before the Anthropological Institute, on May 11, 1886, forms a sequel to Dr. GARSON'S preceding communication, and is printed in advance with the sanction of the Council, in order that the whole subject may be laid before the reader in a complete form.]

The INTERNATIONAL AGREEMENT *on the* CLASSIFICATION *and* NOMENCLATURE *of the* CEPHALIC INDEX.

By J. G. GARSON, M.D., F.Z.S., M.A.I. Lecturer on Comparative Anatomy Charing Cross Hospital; Royal College of Surgeons of England.

IN February last I had the honour to submit to this Institute for the criticism of its members the draft of a scheme for the classification and nomenclature of the cephalic index[1] which, as I then explained, was the outcome of negotiations on the subject

[1] See the preceding paper.

with Professor Topinard of Paris. These were undertaken by me, at the request of the Council, in response to a letter addressed by him to our President pointing out that it was very desirable that an agreement between anthropologists in Britain and France should be come to regarding the cephalic index.

In order that any agreement arrived at regarding this important subject might, if possible, become international instead of being confined to the two countries, the Council thought it desirable that as soon as negotiations between Professor Topinard and myself had proceeded so far as to permit of a scheme being drafted, I should communicate our proposals to Professor Ranke, General Secretary of the German Anthropological Society, through whom negotiations might be conducted with the signatories of the Frankfurt Verständigung, which I did with much pleasure. At the meeting of our Institute in February I was able to state that I had received a letter from Professor Ranke in which he said that personally he could fully agree with the proposed scheme and had submitted it to those who had drawn up and signed the Frankfurter Verständigung. The draft was submitted by Professor Topinard to the Société d'Anthropologie of Paris, about the same time as I brought it before this Institute.

The criticisms of the draft scheme by members of this Institute with which I was favoured were forwarded for consideration to Professors Ranke and Topinard, and those of the signatories of the Verständigung were forwarded to me by Professor Ranke, so that in finally determining upon an international agreement we have had before us the opinions of, I think I may almost say, all the leading anthropologists of Europe. From these being almost unanimously favourable to the scheme, there has consequently been little difficulty in determining its final form which is as follows :—

1. The metric system to be used exclusively in all linear measurements.

2. The cephalic index to be calculated from the maximum length and maximum breadth of the cranium ; the maximum length being the distance between the most prominent point of the glabella of the os frontis in front, and the most prominent point of the os occipitis behind, in the mesial plane. The maximum breadth is the width across the broadest part of the cranium wherever that may be, except on the mastoid processes and the supramastoid ridges, measured vertically to the median plane, the points of measurement lying opposite to one another in the same horizontal plane.

3. The cephalic index to be divided into groups of equal dimensions, each containing 5 units and arranged symmetrically

on each side of a median or central division corresponding to the mean of the human species.

4. The central group to be denominated the *Mesaticephalic* division and to include indices from 75 to 79·9.

5. The quinary division below and above the central group to be termed *Dolichocephalic* and *Brachycephalic* respectively, the former having the limits of 70 to 74·9, the latter of 80 to 84·9.

6. The second quinary divisions—those on either side of the last two—to be termed *Hyper-dolichocephalic* and *Hyper-brachycephalic* with the respective limits of 65 to 69·9 and 85 to 89·9.

7. The third quinary divisions to be called *Ultra-dolichocephalic* and *Ultra-brachycephalic* respectively with limits of 60 to 64·9 and 90 to 94·9.

8. The quinary division of the cephalic index to be extended in each direction as far as there are indices to classify. These divisions may be designated by their limits or by the number of quinary divisions they are removed from the mesaticephalic division, that being considered zero, 0.

Collected in a tabular form the divisions and nomenclature agreed upon is as follows :—

3.	Ultra-dolichocephalic	60 to 65 excl.
2.	Hyper-dolichocephalic	65 to 70 „
1.	Dolichocephalic	70 to 75 „
0.	Mesaticephalic	75 to 80 „
1.	Brachycephalic	80 to 85 „
2.	Hyper-brachycephalic	85 to 90 „
3.	Ultra-brachycephalic	90 to 95 „

I learn from Professor Topinard that anthropologists in France have received the agreement favourably. Adherence to it has been signed by 60 out of the 67, who signed the Frankfurt Verständigung, five of those who signed this latter being since dead, and one having withdrawn his name from it. I am glad to say that all anthropologists in this country with whom I have communicated have intimated their willingness to accept the scheme, notwithstanding the exception taken to some of the details, when the draft was submitted to them in February last. The objections raised then have been carefully considered, as already stated, along with those of anthropologists of other countries who have favoured us with their criticisms. In conclusion I now propose to say a few words regarding those recommended alterations which it has not been thought advisable to accept for various reasons. Professor Flower took exception to the measurement of length from which it was proposed and has now been finally decided to calculate the cephalic index. He stated

that he considered the ophryo-occipital length preferable to the maximum length. In this view he was only supported by Professor Thane in this country and Professor J. Lenhossek, of Buda-Pesth. In the face of the unanimous opinion of French anthropologists, of 59 German, Austrian and other anthropologists who have signed the agreement, and of the majority of anthropologists in this country, it was impossible to come to any other opinion than that we must adhere to the method of calculating the cephalic index defined in the draft scheme, except that the supramastoid ridges have been excluded as well as the mastoid processes.

The only other point regarding which there was a difference of opinion expressed in the Institute was the denomination of the two extreme groups—the ultra-dolichocephalic and ultra-brachycephalic. In place of these names, Professor Macalister recommended the revival of designations proposed by Professor Huxley several years ago, for extreme forms of crania, namely, *Mechistocephalic* and *Brachistocephalic*, on the ground that the term *hyper*, applied to the second group from the centre on each side, and *ultra* meant the same thing. This similarity of meaning has also been pointed out by Professor Thane and Professor Sergi, of Rome. Strong opposition was offered to the revival of Professor Huxley's terms in France, and it was thought preferable to adhere to the prefix "ultra," already proposed, than to introduce new words. The terms *hyper* and *ultra*, it will be observed, are used as prefixes, not as parts of compound words, and the difference of meaning intended to be conveyed by them will be readily appreciable, even by those who are not craniologists.

Professor Welcker has taken exception to several points of the scheme, and is the only anthropologist who does not see his way to accept the agreement. He proposes that the limits of the central group which are 75-79·9 be altered to 77-81·9, in other words, to make it include four units, and he then applies this module to the division of the other groups. The reasons why the module of five units was fixed upon and has been retained is very clearly and carefully pointed out by Topinard, in the Bulletin de la Soc. d'Anthropol. Séance du 18 Fev. 1886, to which I would refer those interested in the subject, and from which it will be seen that it was impossible to accept Professor Welcker's amendment.

I trust those anthropologists whose recommendations the committee have not seen their way to give effect to, may be convinced that we acted without prejudice, and have, in the agreement now registered (if I may use the term), the almost unanimous opinion of anthropologists on each point in question.

Description of a Skull from an ANCIENT BURYING PLACE *in* KAMTCHATKA.

BY ALEXANDER MACALISTER, M.D., F.R.S., Professor of Anatomy in the University of Cambridge.

THROUGH the kindness of Dr. Guillemard, I have received for the Cambridge Museum an interesting skull from Kamtchatka, obtained by him in 1882, on his visit to that country, with Mr. Kettlewell, in the yacht "Marchesa."

This skull had been washed out of an ancient burying-place during a freshet of one of the torrents flowing on the slopes of the Klutschewsk Volcano, and was picked up by a Russian medical man who presented it to Dr. Guillemard.

Comparatively few Kamtchadale skulls have been described, and this is peculiar in many respects. It is that of a female adult and has very loose coronal and squamous sutures, while the two parietals are completely united by a synostosis of the sagittal suture. In capacity the head is microcephalic. In shape it is tapeino-mesaticephalic, very slightly prognathous, megaseme and leptorhine.

The measurements are subjoined—

Capacity, estimated with shot	1290 ccm.
Greatest length, ophryo-occipital	174
„ breadth, interparietal	134
„ height, basio-bregmatic	130
Basi-nasal line	93·5
Basi-alveolar line	97
Orbital height	34
Orbital width	37
Nasal height	42
Nasal width	20
Diameter between pterion and pterion	108
„ „ stephanion and stephanion	110
„ „ asterion and asterion	105
Length from opisthion to glabella	132
Minimum interorbital width	22
Facial breadth, at zygomatic point of maxilla	91
„ „ at external angular process	97
„ „ maximum bijugal	114
Height of posterior nares	18
Greatest width between the internal pterygoid plates	27

INDICES.

Height index	747	Breadth index	770
Orbital „	919	Nasal „	476
Alveolar „	1032		

Of other peculiarities the following are noteworthy. There is a very "capsular" occiput, and the skull in *norma verticalis*, is pentagonal, ill-filled. The frontal bone is flat browed with a short trace of a frontal suture, a supraorbital hole on each side. A transverse green band of staining crosses the bone above the frontal eminences from stephanion to stephanion, as if the skull had been crossed by a copper band. The interorbital part of the frontal is singularly flat.

The union of the two parietals is nearly perfect, a slight superficial trace of the sagittal suture above the lambda being its only relic. There are two parietal foramina, one on each side, and a spheno-parietal suture of 9 mm. on each side.

The occiput has two large holes worn in its supra-occipital portions on each side of, and behind the foramen magnum, each nearly as big as the foramen. The condyles are worn, as if ground off, so is the prominent jugular process, and the small mastoid process of the temporal.

The posterior nares are particularly small and oblique. The palate is long, medially ridged.

The only remaining teeth are the first and second molars of the right side which are much worn; the others have fallen out.

We have not much information as to the race characters of the inhabitants of N.E. Asia. The available sources known to me are from the records of Capt. Cook's last voyage, Kennan's "Tent-life in Siberia," and Rettich's "Ethnographie Russland." From these we gather that the inhabitants of the Peninsula are of three tribes: to the north are the Tschuktches, supposed to number about 7,000, a brachycephalic race with oval faces, prominent occiputs, and projecting brows. In the middle region, south of Cape Pokatchanik, the inhabitants are Koriaks (*Kora*= reindeer) a smaller but still broad-headed people, with large heads and mesoseme orbits. To the south of these live the true Kamtchadales, a people quite distinct from their neighbours, who call themselves Itelm, (= the people) and disown the nickname Kamtschale (=dirty, in Koriak). They are described as a rapidly diminishing people. The adventurer, Beniowsky, who led their revolt against the Russians in 1771, says that there were 70,000 Itelm when Atlasoff subdued them in 1699, and that they had become reduced to 11,000 in 1771. In 1853 they were said to number 7,331, and this number had become still further reduced to 5,846 in 1870. The facial appearance of this skull quite agrees with Capt. Gore's account, that the females are of pleasing countenance.

February 23rd, 1886.

Francis Galton, Esq., M.A., F.R.S., *President, in the Chair.*

The Minutes of the last meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors:—

For the Library.

From the Author.—The Bushmen and their Language. By G. Bertin, Esq.
—— The recent progress of Obstetric and Gynæcological Medicine. By Thomas More Madden, M.D.
—— Die Masken in der Völkerkunde. By Richard Andree.
From Messrs. Longmans, Green, and Co.—The Book of Genesis. By François Lenormant. Translated from the French.
From Deutsche Gesellschaft für Anthropologie. Correspondenz-Blatt, 1886. Nos. 1, 2.
From the Society.—Mittheilungen der Anthropologischen Gesellschaft in Wien. XV Band, 2 Heft.
—— Journal of the Society of Arts. Nos. 1734–1735.
From the Institution.—Journal of the Royal United Service Institution. No. 132
From the Editor.—Nature. Nos. 850, 851.
—— Science. Nos. 157.
—— L'Homme, 1886. No. 1.
—— The American Antiquarian, 1886. January.

The election of Dr. H. Rayner, of the Asylum, Hanwell, was announced.

Mr. Joseph Thomson exhibited a collection of photographs of Africans in the district of the Niger.

The following paper was read by the Secretary:—

On Australian Medicine Men; *or,* Doctors and Wizards of some Australian Tribes. By A. W. Howitt, Esq., F.G.S., Cor. Mem. Anth. Institute.

I.

Introduction.

In these notes on the Doctors and Wizards of some Australian tribes, I deal with instances taken from the Kurnai of Gipps Land, the Murring of Maneroo and the south coast of New South Wales, the Wolgal of the Tumut and Upper Murrumbidgee Rivers, the Wirajuri lower down the latter river to Hay,

the Wotjobaluk of the Wimmera River between Horsham and Mallee Scrubs, north of Lake Hindmarsh, the Jupagalk of the Richardson River and the Woiworung of the Yarra River. It will be seen, therefore, that my facts cover so large a portion of the south-eastern part of Australia that they may not unreasonably be held to apply in all probability, *mutatis mutandis*, to those parts which are left out, as, for instance, part of north-eastern and south-western Victoria. In these notes I have thought it best to record that information which I have collected myself, and to leave the large mass of facts which my correspondents have obligingly contributed as to the magical beliefs and customs which are found in other parts of Australia.

The tribes which I have named above have been the subject of previous memoirs communicated to the Anthropological Institute.

I have adopted the term Medicine Men as a convenient title for this memoir, but the term "Doctor" or "Blackfellow Doctor" is always used in Australia for those men in a native tribe who profess to have supernatural powers. This term is, however, not strictly correct, if by the word "doctor" we mean a person who uses some means for curing diseases. The powers which these men claim are not solely those of healing, nor even those of causing disease, but also such as may be generally spoken of as magical. Thus the doctors are in this sense magicians or wizards. In this paper I shall endeavour to distinguish between doctors and wizards; but I must point out that there are further subdivisions—so that, for instance, the wizards may be either men who profess to perform certain acts upon or for their fellow men (as, for instance, placing them under or relieving them from fatal spells), or men whose magical functions act upon the elements, as, for instance, in producing storm or rain during periods of drought.

I may roughly define doctors as men who profess to extract from the human body foreign substances, which, according to aboriginal belief, have been placed in them by the magic of other doctors, or wizards, or supernatural beings, such as Brewin of the Kurnai, or Ngarang of the Woiworung.

There then remains a class of men who are wizards proper, but who do not all profess to have the same powers or to exercise the same arts, and who may be said to follow different branches of the magical profession. Very near to these are rain-makers, the seers or spirit-mediums, such as the biraark of the Kurnai, and also those bards who employ their poetic faculties for purposes of enchantment—such as the Bunjil Yenjin of the Kurnai tribe.

Some men devote themselves to one branch, some to another,

of the art of magic, and thus arise what would be called amongst us "specialists," such as doctors who especially extract quartz crystals, or wizards who use them to injure other people.

At first sight the subject of these notes may seem to be a simple one, in so far that it might be said that the practices of the "Blackfellow Doctors" are no more than the actions of cunning cheats by which they influence others to their own personal benefit. But on a nearer inspection of the subject it becomes evident that there is more than this to be said. The doctors and wizards believe more or less in their own powers, perhaps because they believe in those of others. The belief in magic in its various forms, in dreams, and in omens and warnings is so universal and is so intimately mingled with the daily life of the aborigines that no one, not even among those men themselves who practise deceit, doubts the powers of the blackfellow doctors, or that if men fail to effect their magical purposes the failure is due to error in the practice, or to the superior strength and power of some adverse wizard.

Allowing for all conscious and intentional deception on the part of the wizard class, there still remains a certain residuum of faith in themselves which requires to be noticed, and if possible to be explained.

It is in this aspect that the question has shown itself most difficult to me. The problem has been, how to separate falsehood from truth, cunning imposture from *bonâ fide* actions, and deliberate falsification from fact. The statements which I have made in these pages are the result of long-continued inquiries as well as personal observation. I must say for my aboriginal informants that I have found them truthful in their statements to me whenever I have been able to check them by further inquiries, and in only one instance did I note any tendency to enlarge the details into proportions beyond their true shape. Even this instance was very instructive. The man's information as to the customs of his tribe, and especially as to the initiation ceremonies, I found to be very accurate, but it was when he began to speak of the powers of the old men of the past generation that I found his colouring too brilliant, and more especially as regarded his tribal father, the last great warrior-magician of the tribe. In his exaggeration of the exploits of these men one might see an instructive example how very soon romance begins to gather in an heroic halo round the memory of the illustrious dead.

II.

The Supernatural Powers claimed by the Doctors and Wizards.

The wizards were everywhere credited with the power of con-

veying themselves through the air, or of being conveyed by the ghosts from place to place, or from earth to sky. Numerous accounts have been given to me by blackfellows of the "going up" of these wizards. As might be expected, it occurred always at night, and the return of the wizard was frequently by means of a tree, down which he was heard to descend and finally to jump on to the ground. At times he returned attended by the ghosts, whose muffled voices and the sound of whose footsteps could be heard by the listening tribespeople. I need not enlarge on this subject here, as I shall have to return to the subject later on.

There is a belief in all the tribes I refer to that men of the wizard or doctor class (and therefore over at least a very large extent of south-eastern Australia) can project substances in an invisible manner against their victims. One of the principal projectiles is said to be *quartz*, especially in its crystallized form. Such quartz crystals are always carried as part of the apparatus of the blackfellow doctor, and are usually carefully concealed from sight, especially of women.

When travelling in the Darling River back country, before it was settled, I saw a very good instance. A blackfellow doctor accompanied me during a day's journey, and alarmed my two black boys by seemingly causing a quartz crystal to pass from his hand into his own body. Such sleight of hand as his is evidently indicated by the account given later on of the manner in which Mŭri-Kangaroo was trained for a wizard.

These quartz crystals are exhibited by the wizards at the initiation ceremonies. I have described this already elsewhere and need not repeat it.[1] Of all magical substances the crystal of clear and translucent quartz holds the first rank in the estimation of the Australian aborigines. Yet in the central clans of the Kurnai tribe the black stone called *bulk*[2] is more regarded, and as far as this particular community is concerned, it is only among the Brataua Kurnai and the eastern Krauatun Kurnai, who adjoin the Kulin and Murring tribes respectively, that the quartz crystal is held in dread esteem.

The account which I shall give of the manner in which the Brataua Kurnai named Tankli became a blackfellow doctor brings the belief in the magical powers of the quartz crystal into full view.

Connected with the throwing of magical substances in an invisible form is the belief that they can be caused to enter the body of a victim by burying them in his footsteps, or even in

[1] On Some Australian Ceremonies of Initiation (Journ. Anthrop. Inst., vol. xiii., 1884).

[2] Kamilaroi and Kurnai, p. 251.

the mark made in the ground by his reclining body. Sharp fragments of quartz, glass, bone, charcoal are thus used, and rheumatic affections are very frequently attributed to them.

Another form of this belief is seen in the practice attributed to the western neighbours of the Woiworung of putting the cone of the *Casuarina quadrivalvis*[1] into a man's fire, so that the smoke might blow into his eyes and cause him to become blind.

In all these tribes a general, I may say almost an universal, practice has been to procure some article belonging to the intended victim. A piece of his hair, some of his fæces, a bone picked by him and dropped, a shred of his opossum rug, or at the present time of his clothes, will suffice, or if nothing else can be got he may be watched until he is seen to spit, when his saliva is carefully picked up with a piece of wood and made use of for his destruction (Wotjobaluk tribe).

The old beliefs are also adapted to their new conditions since the settlement of Australia by the whites. The Woiworung dreaded a practice attributed to the aborigines living about Echuca. It was said that they mixed pounded flesh of a dead man with cut-up tobacco, and offering this to the unsuspecting victim, caused him to fall under the fearful spell of death when he smoked the mixture. The result was believed to be internal swelling of the smoker until death ensued.

There is evidently a belief that doing an act to something which is part of a person, or which even only belongs to him, is in fact doing it to him. This is very clearly brought out by the remark of one of the Wirajuri, who said to me, "You see, when a blackfellow doctor gets hold of something belonging to a man and roasts it with things, and sings over it, the fire catches hold of the smell of the man, and that settles the poor fellow." This belief is evidently world-wide, and has no doubt existed throughout all time of human history. It culminated naturally in the roasting of waxen images, which for aught I know has scarcely yet died out in the British Isles.

The Kurnai practice is to fasten the article to the end of a throwing stick, together with some eaglehawk feathers, and some human or kangaroo fat. The throwing stick is then stuck slanting in the ground before a fire, and it is of course placed in such a position that by-and-by it falls down. The wizard has during this time been singing his charm; as it is usually expressed, he "sings the man's name,"[2] and when the stick falls

[1] The idea seems to be that the *eidolon* of the hard rough jagged cone will magically produce injury, such as the cone itself might do. This belief points to an attempted explanation of the acute agony of ophthalmia.

[2] The secrecy with which personal names are often kept from general knowledge, arises out of the belief that an enemy who has your name, has something which he can use magically to your detriment.

the charm is complete. This practice still exists. While writing this paper one of the Kurnai, whom I have elsewhere mentioned,[1] named Tankowilin, came to me to request the loan of a throwing stick which I have, and which is regarded as being of special power, having been used at an initiation ceremony.[2] He informed me that he wanted it in order to "catch" one of the tribe who had married a relation of his, a widow, without the consent of her kindred, and also far too soon after the death of her husband: indeed, so soon after that it had "made all the poor fellow's friends sad thinking of him." When I refused him the loan of the *mŭrriwŭn*, he said it did not matter, for that he and his friends had made "a very strong stick to point at him with by singing his name over it, and spitting strong poison over it."

The sense of the word poison as used here is not as we use it, but means "magic," or it might be expressed by the word "medicine," as applied among the North American Indians.

The Gūliwill.[3]—A good illustration of the practice of roasting things is afforded by the Wotjobaluk tribe, and which will also serve for their neighbours, the Jupagalk, and the more distant Wirajuri. The only difference in practice is that with most tribes the article is roasted attached to a throwing stick, while Wotjobaluk use a peculiar apparatus called a *gūliwill*, and the Jupagalk a "yamstick."

The *gūliwill* consisted of several small spindle-shaped pieces of Casuarina wood, on which marks were made, such as the effigy of the victim, and one of the poisonous snakes. These *gūliwill* were tied up tightly together with human fat and the article obtained from the intended victim, and then roasted for a long time, or several times at intervals. After the whites settled the country at the Wimmera river, the Wotjobaluk, who were

[1] Kamilaroi and Kurnai, p. 247.

[2] The Jeraeil of the Kurnai tribe. It is interesting to note that the throwing stick (*mŭrriwŭn*) is supposed to have inherent magical powers. It is not necessary to anoint it with fat, human or animal, as is the case with spears or clubs. I think the idea may be traced to the difference between throwing a spear by hand and throwing it by means of the *mŭrriwŭn*. The blackfellow perceives that the *mŭrriwŭn* gives the spear a surprising impetus, and not being able to explain its mechanical action, he considers that it is magical. This is a good instance of the manner in which the aboriginal mind works.

[3] Apparently from *Gūli*=rage, anger, and not from *Gūli* or *Kūli*=man; as an example, the following:—

Gūli-yan, I am enraged.
Gūli-yara, thou art enraged.
Gūli-ya, he is enraged.
Gūli-yengal, we (two) are enraged.
Gūli-yangno, we (all) are enraged.
Gūli-yangwŭl, you (two) are enraged.
Gūli-yau-woijauwot, you (all) are enraged.

employed on the stations, as I am told, found the great chimneys of the huts, especially of that used as a kitchen, unrivalled places in which to hang their *gūliwill*, so as to expose them to prolonged heat.

The following account was given me of the effects produced by such a *gūliwill*, or the belief in it, which is much the same thing. "Sometimes a man dreams that some one has got some of his hair or a piece of his food, or of his 'possum rug, or indeed anything almost that he has used. If he dreams this several times he feels sure of it and calls his friends together, and tells them that he is dreaming too much about 'that man,' who must have something belonging to him. Sometimes the suspected *bangal* (wizard) being spoken to admits that he has something that he is burning, but excuses himself by saying that it was given him to burn, but that he did not know to whom it belonged. In such a case he would give the thing back, telling the sick man's friends to put it in water, so as to wash the fire out. In such cases the sick man would feel cooled, and most likely get well!"

There was the same belief in the tribes to the eastward of the Wimmera river: for instance, the Jupagalk; but the *bangal*, instead of using a *gūliwill*, tied the objects by a string to a yamstick stuck before a fire, and when the cord was burned and they fell the charm was complete.

The omental fat.—Of all the arts attributed to the wizards, that which was perhaps the most dreaded was the abstraction of a man's fat. This is usually spoken of by the whites as the taking of kidney-fat.[1] This belief is a very widespread one. It is not confined to those parts of south-eastern Australia to which these notes refer, but is found throughout the continent in so many places that I believe it to be universal. The Murring, Ngarego, Theddora (of Omeo), Wolgal and Wirajuri called this practice by some form of the word *bŭkin* or *bŭgin*. The Kurnai call it *brét-bŭng*, or "with the hand." The men who practised it were called *bŭra-bŭrŭk* or "flying," or also *brét-bŭng mūngar-wárūgi*, or "with the hand from a long distance." They were believed to throw their victim into a magical state by pointing at him with the *Yertŭng*, which is a bone instrument made of the fibula of a kangaroo.

In the Kurnai tribe, men have died believing themselves to

[1] So far as I know, there is no "kidney fat" in man, as there is, for instance, in the sheep. The only fat near to the kidney seems to be in the folds of the peritoneum on which it rests, as on a cushion, or fatty substance, as the suprarenal capsules, which, however, are quite insignificant. The position in which the victim is, as it seems, laid on his back, and the situation of the incision in front and just below the ribs, clearly indicate the omentum as the source of the fat taken.

have been deprived of their fat, there being no signs of violence whatever on their bodies. At the same time there is no doubt that the fat-taking was actually practised. An informant, on whom I can fully rely,[1] tells me that when a boy he saw two old men secretly roasting and eating fat taken from a dead blackfellow, and they observed to him that now they would have the strength of the other man.

The effect of dreams, wherein the sleeper believed that he had fallen into the hands of such wizards may be imagined, and it is indicated by my Woiworung informant, who, speaking to me on this subject said, "Sometimes men only know about having their fat taken out by remembering something of it as in a dream."

I have said that the Murring called the fat-takers *bukin*. The belief extended with the same name in dialectic forms across the Maneroo tableland to Omeo and down the Murray and Murrumbidgee waters. The Wirajuri greatly dread the *bŭgin* and their practices, and attribute to them all kinds of supernatural powers. They are generally believed to be the wizards of neighbouring tribes. They are supposed to carry an instrument made of the pointed leg-bone (*fibula*) of a kangaroo, having attached to it a long cord of twisted sinews, ending in a loop. Watching until the victim sleeps, the wizard is supposed to creep to him, pass the bone under his knees, round his neck, through the looped end of the cord, and thus having secured his victim, to carry him away to extract his fat. How this is done will be seen by the account given to me by a Jupagalk man.

The *bŭgin* is believed to walk invisible, to turn himself at will into an animal, as for instance a kangaroo. My Wirajuri informant, in speaking to me of the *bŭgin*, of whom he expressed great dread, said as follows, "If I saw an old man kangaroo come up hopping close and sit and stare at me, I should keep my eyes fixed upon him, and try to get out of his way, lest he might be a *bŭgin*, who, getting behind me, would take me at a disadvantage."

Moreover, the *bŭgin*, when hardly pressed, is believed to be able to turn himself into a stump or a log, or even to go down into the ground out of sight—and thus escape his pursuers. A very dangerous practice attributed to the *bŭgin* is to get inside of a tree, and then, when a blackfellow is climbing it, to cause a limb, of which he has laid hold, to break off suddenly, so that he falls to the ground, and becomes an easy victim.

When the Wirajuri feels his flesh twitch he knows that a *bŭgin* is near; and thus is of the opinion of the second witch in

[1] Mr. James McAlpine, of Tarraville.

"Macbeth," who says, "by the pricking of my thumbs, something wicked this way comes."

Crossing from the Lower Murrumbidgee and the Murray rivers to the Wimmera, about Lake Hindmarsh we find the same belief in full force. Here is the account of the fat-taking powers of the Wotjobaluk wizards as given to me by one of the old men of the tribe.

The favourite plan is the usual practice of sneaking upon the victim when asleep. Or the *bangal* (wizard), if he is acquainted with his intended victim, manages to arrive at his camp so late as to be asked to remain all night. Pretending himself to sleep, he watches until his host is in sound slumber, when he passes his fatal "*yūlo*" [1] under his knees, round his neck, and through the loop, and so carries him a little way from the camp.

The old man also gave me an account of the manner in which the fat was always taken, whether the victim were noosed by the *yūlo*, or knocked down by a blow of the *brépent*[2] on the back of the neck. The victim was laid upon his back, and the wizard, sitting astride of his chest, cut him open on the right side, below the ribs, and thence extracted the fat.[3] Then bringing the edges of the cut together, and singing his spell, he bit them to make them join, so that no scar should be visible. Then he retired to a distance, leaving the man lying on his back. He sings a song, which causes the victim to rouse up, and stagger about, wondering how he came to be "sleeping out there." This proceeding is called *déking-ngálŭk*, or "open-side."

If the victim were a stranger, the wizard would not take so much trouble, but would leave him lying. If he be some one he knows, he does as above related, and moreover he is careful, when laying him out preparatory to operating upon him, to place him in that direction in which the dead of his *totem* are buried.[4]

The Mŭkjaraweint, a tribe which adjoined the Wotjobaluk to the south, had a similar belief as to the fat-taking wizards. The account given to me of their proceedings was almost identical with that just noted, the only difference being, that unless the *bangal* takes precautions, the victim will follow him when he recovers his senses. He therefore hides until he sees him rise

[1] *Yūlo* = bone.

[2] *Brépent* is a club with a knot at one end.

[3] The position in which the victim is here laid shows, as previously stated, that it is the omental fat which is taken.

[4] The Wotjobaluk have six principal *totems* arranged under two principal classes, Krokitch and Gamutch. Each *totem* has a particular direction in which its members are buried. For instance, *Wártwŭt* (hotwind) with the head a little to the west of north, that is, in the direction from which the hot wind blows in their country. *Gnáui-ngagŭli* (belonging to the sun) to the east, that is, towards the sunrise; and so on with the others all round the compass.

and stagger towards him, when he turns him away homewards by throwing some earth at him.

The time which will elapse before the victim dies is fixed by the wizard walking along the nearest fallen tree trunk. Its length in strides fixes the number of days he has to live. The victim going home feels ill, does not know what is the matter with him, but by-and-by, just before he dies, he dreams of the man, or of the men, if there were more than one, who have taken his fat, and so is able to tell his friends, who make up a party to revenge him.

This belief in a sort of clairvoyance just before death seems to be very general among the aborigines. I have found it in the Wirajuri, where a man, just before his death, said to his friends who were standing round him, "Go on one side, so that I may be able to see who it is that has caught me."

It occurs in Gippsland also. A few years ago one of the Kurnai died from the effects partly of drinking and partly of exposure. When so near death that he was lying speechless in his camp, his great friend Tankowilin, whom I have before mentioned, besought him earnestly to tell him who it was that had caused his death, and was inconsolable because the sick man died without being able to tell him.

The belief in the abstraction of fat by wizards, and its magical powers, was also held by the Jupagalk. An account has been given me by a very intelligent man of this tribe of what he saw as a boy. His account is as follows:—

"When I was a boy about ten years old I went out one day with some of the men to hunt. We were all walking in a line, when one of them hit the man in front of him on the back of the neck with his club and knocked him down. Two or three of the men held me tight, so that I could not run away, for I was very frightened. Then the man cut open the one he had knocked down, by a little hole in his side below the ribs, and took out his fat. After that he bit the two edges of the cut together and sang a song to make them join, but he could not succeed. He then said that he could not do this because someone had already taken this man's fat before, as he could see by the marks upon his liver, and that whenever a man had been opened and closed up no one could do it again. As they could not wake the man up they buried him. They smoked the fat over a fire, and took it away tightly wrapped up in a cloth. They wanted it to carry with them to make them lucky in hunting."

The Yūlo.—The bone instrument, which I have several times mentioned, was also used in all the tribes for other magical purposes, as, for instance, injuring people by pointing it at them

from a distance, when, as in the case of the quartz crystal, it was supposed to enter them and produce death.

The Wotjobaluk called it, when used in this way, *yūlo-witchinwelli*,[1] or "the flying yūlo," because it was not only pointed, but also magically thrown at a person. The wizard having sneaked to such a distance that he could see his victim's camp fire, and thus distinguish him by its light, was supposed to swing the *yūlo* round his head and launch it at him. The *yūlo* was believed to dart into the victim invisibly, and then compel him to come out to the wizard, who, throwing him over his shoulder, carried him off.

A Jupagalk man explained the way in which this kind of *yūlo* was made magically powerful. In his tribe it was called *yūlo*, and the practice was called *wónjerŭp*, or "pointing." The *yūlo*, or bone, was the fibula of a kangaroo, pointed at one end, and having at the other the sinews still attached, out of which —and strips of human skin taken from a corpse—a cord was twisted. The instrument, when completed, was about twelve inches in length, and the cord thirty-six inches. To render it deadly, it was smeared with the fat of the corpse from which the skin was taken, and with the juices dropping from the stage upon which the corpse was laid to dry.[2] The instrument was rubbed with ruddle.

As in the Wotjoballuk belief, here also the wizard was thought to swing the *yūlo-jinert*[3] round his head, and then launch it at his victim. People who fell ill were often asked by their friends, "Have you not dreamed of the man who has pointed the bone at you?"

The belief that a victim could be caused to leave his camp by means of the "flying yūlo" is paralleled by the belief of the Kurnai that men called *bunjil barn* could cause their victims to walk to them by reason of their enchantments. I have described these at length elsewhere,[4] and need only add here that the pieces of wood from which they received their name were in shape like the *gūliwil* of the Wotjobaluk, and, like them, made of the Casuarina. Their magic fire round which they danced, singing the name of their intended victim, is exactly the magic fire (*tálmarū*) of the Murring initiation ceremonies, and the *bunjil barn* being rubbed over with charcoal, followed the custom of the initiation.

The Lesser Magic Familiars.—The doctors or wizards, of whose

[1] *Yūlo* = bone, *witchin* = feather.

[2] The first witch in "Macbeth" also believed in the magical power of "grease that sweaten from the murderer's gibbet."

[3] *Jinert* = sinew.

[4] Kamilaroi and Kurnai, p. 252.

practices against mankind I have now given some account, were the greater practitioners of magic, but there were also men who practised the lesser magic. These are credited with magical powers less in degree and usually different in kind from those of the doctors and wizards whom I have described.

I take an instance from the Kurnai. One of the Brataua clan dreamed several times that he had become a lace lizard,[1] and as such had assisted at a "corroboree" of those reptiles. Thus as it was believed, he acquired power over them, and he had actually a tame lace lizard in his camp, while his wife and children lived apart in a camp close by. The lizard accompanied him wherever he went, sitting on his shoulders, or partly on his head, and people believed that it informed him of danger, assisted him in tracking his enemies or young couples who had eloped, and, in fact, was his friend and protector. As might have been expected, people also believed that he could send his familiar lizard at night to injure people in their camps while they slept. In consequence of this comradeship with lace lizards, and probably because he was in some manner one of them, he received the name of Bunjil Bataluk.

I remember, many years ago, before I took any critical notice of these aboriginal beliefs, that there was an old Bidweli woman who was much feared because she had a tame native cat which she carried about with her, and which was believed to injure people during sleep at her wish.

Rainmakers.—Rainmakers and weather-changers must not be forgotten in an account of the lesser magic of these tribes. In Gippsland the rainmakers were not usually benevolent individuals who called up refreshing rains after periods of drought as did their analogues in the dry northern districts, but malicious persons who raised storms of wind and rain and floods which did injury and prevented the Kurnai from following their daily vocations in hunting and fishing.

These rainmakers were called *Bunjil-Willŭng*,[2] and it is said of them as of the other Kurnai wizards, that they obtained their powers during dreams. I have before spoken of one of the Braiaka headmen who was credited with the power of calling up the furious west wind, whence he derived his name Bunjil-Kraura.[3] He, as all others of these men, used songs,

[1] *Hydrosaurus varius*, commonly called the Iguana, called by the Kurnai *bátalŭk*. Mr. McAlpine remembers the man here spoken of well. He describes him as a very reserved, quiet-tempered man, who kept very much to himself. He had a great reputation for magical powers, and was the father of the Tankli spoken of in this paper.

[2] *Willŭng*=rain. The Kurnai say that the frogs, when croaking in chorus in the swamps, are "singing for the rain," and that the big sonorous bull-frogs are the *Bungil Willŭng*.

[3] Kamilaroi and Kurnai, p. 211.

which were often accompanied by some expressive pantomime. One of the well-remembered *Bunjil-Willŭng* of the Brataua clan used to call up storms of wind and rain by filling his mouth with water and squirting it out towards the west, from which quarter the storms came in Western Gippsland. This he did to aid the charm which he sang. Even women acquired these powers, and there is now an old dame who has a great reputation for calming the storms by her songs, which speak of the furious winds blowing the leaves off the trees.

Each Kurnai clan had a direction from which its *Bunjil-Willŭng* called up rains. The Brataua and Braiaka sang towards the west or south-west, the Tatung to the south, and the Brabra and the Krauatun to the south-east. The fact is that from these quarters come the prevalent rains which fall on the country of the clans named. Thus, when a westerly rain fell over the Brabra country, it was said that the Braiaka *Bunjil-Willŭng* had sent it, and so on with the others.

It was also thought that the *Bunjil-Willŭng* could bring or send thunder. Morgan, the headman of the Brataua clan, was a *Bunjil-Willŭng* as well as in other respects a powerful wizard, and could, they thought, bring thunder at will.

By reason of this power, and on account of his deep growling voice, he received also the name of Bunjil-Gwórŭn.[1]

Another instance of the beliefs as to rainmakers will suffice. Among the Wotjobaluk these men were not necessarily *bangal*; in fact, as I learn, few of them were. The offices were distinct. In order to produce rain he took a bunch of his own hair which he carried about with him for the purpose. Soaking it in water he sucked the moisture out and then squirted it to the westward. Or he twirled the ball round his head so that the water flowed out like rain. In this arid district the office of rainmaker was much thought of.

The Yenjin, one of the most curious practices of the lesser magic I have found in the Kurnai tribe, seems so far as I yet know to have been peculiar to them. The men who practised it were called *Bunjil-Yenjin*.[2] The *Yenjin* is a song peculiar to elopement, as the *Gūnyeru* is a song which accompanied dances.

[1] *Gwórŭn* = thunder. The Kurnai had a curious belief about thunder. The Spiny Ant-eater (*Echidna hystrix*) is said by them to be the *Gueabŭn* (wife's mother) of the thunder, and that in consequence whenever it hears the voice of the thunder (its daughter's husband) it endeavours to hide itself by burrowing in the ground. It is also interesting to note, as showing how beliefs in tribes far apart are connected, that the Woiworung, who believed that thunder was something which came from the *Tharangalk*, the country beyond the sky, for the purpose of smashing up trees, also thought that the *Echidna* had command over it, for they have a legend of how Bunjil ordered it to smash up a rock with its thunder within which a stolen child had been hidden.

[2] In the Nŭlit dialect this was softened to *Yenin*.

There are now no *Bunjil-Yenjin* among the Kurnai, and probably the office has been vacant for over twenty years. Before that time there was at least one in each division of the tribe. Some men were more celebrated than others, and of them Morgan whom I have just mentioned had a great name.[1]

The following account is derived from the statements of the Kurnai and partly also from those of two old residents of Gippsland, who in the early days were, as boys, much with the blacks in their camps, and thus observed and now remember many practices which are now obsolete.[2]

It seems from these statements that almost the last time when the Bunjil-Yenjin exercised their office on a large scale was at the holding of a *Jeraeil*,[3] on the south side of Lake Wellington, about 20 to 25 years ago. At it ten or a dozen young couples "ran off" under the influence of love and the songs of the *bunjil-yenjin*. Some few of the people who were there are still living, and from them, and especially from one woman who was a girl at that time and who then "ran off" with her future husband, I have received very full accounts of what was done.

The substance of these statements is as follows. It was the business of a *bunjil-yenjin* to aid the elopement of young couples. For instance, when a young man wanted a wife and had fixed his mind upon some girl whom he could not obtain from her parents, he must either go without her, persuade her to run off, or call in the aid of the *bunjil-yenjin*. In this latter case he retained him by presents of weapons, rugs, &c. The *bunjil-yenjin* then lay down in or near the encampment, next to him was the young man, beyond him his comrades. The *bunjil-yenjin* then sang his song and the others all joined in with him.[4] The following is one of the songs, of which there are very many, used on such occasions, and it is said to have been a most powerful one. My Kurnai informant, whose wife had been one of the girls who eloped at the *Jeraeil* I have mentioned, said, in speaking of it, "That *yenjin* made the women run in all directions when they heard it."

Bára-bărni.	*Wángŭr.*[5]	*molla.*
Roll up the twine.	jaw.	down there.

[1] Mr. McAlpine remembers that Morgan was one of the great singers of the tribe.

[2] Mr. J. McAlpine, of Tarraville, and Mr. W. Lucas, of Woodside.

[3] Initiation ceremony.

[4] Mr. McAlpine remembers, as a boy, hearing these songs on several occasions, and seeing girls going about the camp covering their ears with their hands. In answer to his inquiries these damsels said that the young men wanted them to run off, but that they did not want to do so.

[5] *Wangur*=the Jaw, the girl's name. The name of course varies in each application of the charm.

tállo-burni.	*tallo.*	*káragan.*
little twine.	little.	sweetheart.
ngella gálli.	*karnang.*	
I go first.	the hollow (to).	
góla.	*yinna.*	
before.	you.	

This performance—ceremony it might even be called—was well known to all in the camp, for there was no concealment, and if done at any little distance there was always some female friend of the girl—some "sister, or a cousin, or an aunt"—to carry her the news and say, "So-and-so is singing a *yenjin* about you."

When the *bunjil-yenjin* thought his spell strong enough, he ceased his song. In one case, where Mr. Lucas was present, Morgan was the *bunjil-yenjin*, and the girl's parents covered themselves up with their rugs as if asleep.

Before, however, the youth could avail himself of the spell thus cast upon his "little sweetheart" something more had to be done, and probably in the case mentioned by Mr. Lucas it preceded the covering up of the parents. Another wizard had to use his art to send them asleep. In the case of the *Jeraeil* which I have mentioned, this man was the renowned Bunjil Dáuangŭn,[1] and his proceeding was as follows:—Being paid by the youth with weapons and 'possum rugs, he stuck his magical throwing stick in the ground, slanting towards the camp of the parents, and with such an inclination that after a time it would fall down. By its side he placed his *bulk*,[2] and at a little distance his *yertŭng*,[3] and beside it his *gūmbart*.[4] He then sang his song, and when the throwing stick fell the charm was complete, and the parents supposed to be wrapped in a magical sleep.

The youth might now run off with his sweetheart, but only after a formality which shows that the final choice rested with her. Stealing round to the back of her parents' camp, in which she was sitting, he touched her with a long stick, and she being ready to run off, pulled the end as a signal. The young man then left, and the girl having packed up her bag (*batŭng*)—in fact, having her trousseau ready—flitted after him.

In this case which I am now describing the proceedings were not yet over. After a time, according to my informant, the old people woke up, and finding their daughter gone, the old man

[1] Kamilaroi and Kurnai, p. 211.

[2] Kamilaroi and Kurnai, p. 251.

[3] A small instrument made of Kangaroo bone, in some respects the analogue of the *yūlo*.

[4] The bone nose peg.

summoned his kindred[1] to assist him in singing a song which was believed would cause the youth's legs to become so weary that he would not be able to make his escape. Finally, the father took his *mŭriwŭn* (throwing stick), and, holding it loosely in his right hand, made blows with it towards different points of the horizon. When it gave a sound like a crack it indicated the direction in which search after the runaways was to be made.

Mr. Lucas tells me that he remembers being present when a couple, who had run off by means of a *bunjil-yenjin*, voluntarily returned after a time. One of the old women went out of the camp and brought them in. Mr. Lucas is not aware what was done to them, excepting that the young man had afterwards to stand out and submit to an ordeal of weapons of some kind.[2]

III.

The Wizard as a Healer.

I have now spoken at some length of the manner in which the blackfellow doctors have been accustomed, according to the belief of the aborigines, to work ill upon them. It remains to show these men in a somewhat more favourable light, as alleviating suffering and shielding their friends from the machinations of enemies or revenging those who had fallen victims to other wizards.

One of the special functions of the blackfellow doctors is to counteract the effect of spells wrought by others of their own class.

Their method of procedure is so common among savage tribes, and has so often been described that it may be dismissed with a few words. The cure is effected by sucking the affected part

[1] Descent with the Kurnai is in the male line. There are certain animal names, Sea Salmon, Wambat, which go from father to children, and probably represent former *totems*.

[2] Many other particulars might be added, bearing upon the subject of marriage by elopement as practised by the Brataua Kurnai, and as witnessed by Mr. McAlpine in the early years of settlement in Gippsland. But these statements would be foreign to the purpose of this paper. Those which I have given are connected with the Lesser Magic, and they fully confirm all I have elsewhere said as to elopement having been one of the recognised forms of marriage with the Kurnai. The old people in the case of the *yenjin* winked at the elopement, and yet punished the principal actors in it when they returned. I am now satisfied that the explanation of this extraordinary state of affairs is to be sought for in the restriction upon marriage which was produced by the combined action of the widespreading archaic system of Kurnai kinships and the prohibition of marriage within the local groups.

The prohibition arising thus from the prohibited degrees, and from locality, rendered it next to impossible for a man to find any woman who was not in some way related to him in such a manner as to become forbidden to him as a wife. Consent of parents and relatives could only be obtained in the rarest cases, hence recourse was had to the only possible alternative, namely elopement, and the office of the *bunjil-yenjin* arose in time to lend a sanction to the proceedings.

and exhibiting, as having been extracted thereform, some foreign body which had caused the ill; or by sucking the place and expelling the evil influence as a mouthful of wind; or by various manipulations, pinchings, squeezings, to allay the pain. In some cases the "poison" as they call it now, is supposed to be extracted through a string, or a stick from the patient to the doctor, who spits it out in the form of blood.

Charms are also sung to cure people. A very good instance occurred at the Jeraeil which I attended in February, 1884. One evening I heard a most extraordinary song proceeding from the camp of the second headman, Tulaba. I found him driving away pains which were troubling his old wife. He told me that he was singing a very powerful song which his father had lately taught him while he slept. The words are as follows, with a most extraordinary emphasis, when sung, upon the last word.

Mínyan	*būlūnma*	*náranke*
Show	belly	moon to.

As an illustration of the methods generally used, I can give the case of the Kurnai, Tankli, the son of the lace lizard man. His method of cure was to stroke the affected part with his hands until, as he said, he could "feel the thing under the skin." Then covering the place with a piece of cloth, he drew it together with one hand, and unfolding it, exhibited within its folds a piece of quartz, bone, bark, charcoal, even in one case a glass marble, as the cause of the disease. The use of the cloth is evident to any one but a blackfellow.

The curative powers of the wizards were, however, in many cases of a much higher order. The following account was given of a celebrated wizard of the Jupagalk by one of the men who was present, and I subjoin it as nearly in his own words as possible.

"A blackfellow was very bad, and about dusk King Barney came to see him. At dark he went off for a time. By and by we saw a light afar off, and as it seemed above the tree tops, it looked first like a star in the east. Then it went round to the west and kept coming nearer and nearer. At last we saw the *bangal* walking along the ground carrying a piece of burning rag in his hand. His legs were covered with something like feathers which could be seen by the fire-light, and the people said it was the 'bangal's feathers.' He sate down by the poor fellow, saying he had been over to the Avoca River, where he found a man who had the rag tied on a yamstick roasting it before the fire. He then rubbed the place where the man was sick and sucked out of it some pieces of stone and glass. The man then soon got better."

In this tribe when a man died it was the office of the *bangal* to go out with the relatives and watch at the grave, for it was believed that during the night the spirit of the wizard who had killed him would come and peep at the grave out of the bushes. He having thus been seen by the *bangal*, the relatives of the deceased were in a position to have revenge.

The Woiworung Wirarap.

In the Woiworung tribe the wizards (*wirarap*) besides making use of the ordinary curative processes which I have mentioned, practised also their art in extracting quartz crystals which were believed to have been projected by other wizards or doctors or by the supernatural being called Ngarang. The quartz crystal was believed to be projected in the form of a small dust whirlwind against the victim. In describing this, my informant Barak said as follows: "The man being struck felt cold, suffered pains all over him, then shortness of breath. Some wirarap seeing him might say 'Hallo! there is a lot of *mūng* (magic) in you.' The cure was for several wirarap to watch the man until they saw the *mūng* escaping like a little dust whirlwind from him.[1] It was then going back to its owner, and the wirarap would run after it and the one that caught it would break a little bit off so that it could not leave him any more. Then he would put it in his bag with his other things."

When a person believed himself to be under some spell by a person who had got something belonging to him, his resource was to the wirarap. That which was thus acted upon was called *yarūk*. He might suspect that some harm was impending over him by having a dream, for instance, of a kangaroo hopping towards him, and if he then became ill he would consult the wizard. My informant gave me this as an illustration:— "The Wirarap looking at him might say, 'Yes! the fire is up so high (pointing to his waist). It is well you came to me in time, for the next time they burned that thing belonging to you it would be up so high (pointing to his neck) and then you would be done for.' The wizard was then supposed to go to the place where the culprit lived, the next time the wind blew from it. He would go through the air to the place where the *yarūk* was concealed, pull up the throwing stick with it attached and bring it back. Giving the *yarūk* to the sick man, he would say to him something like this, 'You go and put this in a running stream to wash all the *mūng* out of it, and I will go up aloft and put this throwing-stick in some water up there.'"

[1] *Brewin* of the Kurnai is supposed to travel in such little whirlwinds. I have heard the Kurnai say, when seeing such a little spiral of dust and leaves in the forest, "Get out of the way, there is *Brewin* coming."

The functions of the wirarap related also to the cause of death in so far that it was his office to inform the relatives of the deceased who had been the aggressor. In order to do this he watched by the grave in order to see the spirit or "wraith" of a culprit sneaking round to see where his victim had been buried. When no wizard was available, the relatives in digging the grave, sought for some worm-hole, or grub-hole in it, and having found one poked a small stick or straw down it and by the inclination learned the direction in which to seek the culprit.

The power of the wirarap extended not only to the cure of afflicted persons and to the discovery of the person who had caused death by magic, but also, in some instances, at least to the bringing back of the departed spirit. Such a man is said to have been the Wirarap Doro-bauk,[1] who lived near Mt. Macedon. The following account was given me by a Woiworung man who was present.

"Soon after the white men came to Melbourne, a blackfellow, near where Heidelberg now is, was very nearly dead. His friends sent for Doro-bauk, who, on his arrival found the man only just breathing the least possible, and his *mūrūp* (ghost-spirit) had gone away from him. Nothing remained but a little wind. Doro-bauk went after the *mūrūp*, and by-and-by returned with it under his opossum rug. He said he had been just in time to catch it round the middle before it got near to the *karalk*.[2] The dead man was still breathing a little wind when Doro-bauk laid himself down upon him and put the *mūrūp* back into him. After a time the man came back to life."

The wirarap also in this tribe exercised supervision over the youth who had been made *jibauk* (initiated). He could dream of their actions. But the novice was also under supernatural penalties if he broke the food laws or rules of conduct laid upon him. Thus the Kulin of the Goulburn River, who were the neighbours of the Woiworung, and nearly allied to them, believed that if the novice ate the spiny ant-eater or the black duck, he would be killed by the thunder.[3] If he ate of the female of the opossum or native bear, he was liable to fall when climbing

[1] *Doro*=a grub. *Bauk*=high up.

[2] *Karalk* is the bright colour of sunset, and is said to be caused by the spirits of the dead going into and out of Ngámat. Ngámat is the receptacle of the sun beyond the western edge of the earth. It seems that the dead do not remain permanently in Ngámat, for they are spoken of as returning, and are then spoken of as Ngamajet. The white men were also called Ngamajet. The Kulin of the Western Port District, neighbours of the Woiworung, used the word *Taringūra* as the equivalent of *Karalk*. This is explained to me as being also the word applied to a place on fire, as for instance an incandescent hole in the ground, out of which a tree stump has been burned, such as may be seen after any bushfire.

[3] See footnote, p. 35.

trees, and so on for other similar offences. If the novice fell ill, and his conscience pricked him, his only chance of safety would be to present himself to the wizard or doctor.[1] My informant said that something as follows would occur: "The wirarap looking steadily at the boy, would say, 'There is a lot of *mūng* (magic) in you!' After a pause he would commence to rub the youth's leg, and after a little more time produce a small young 'possum and say, 'This has happened to you because you have been eating 'possum too soon.'"

Precisely similar supervision is exercised by the wizards of the other tribes after initiation over the novices.

I have before mentioned that the Woiworung believed that men could be injured by an evil being called *Ngarang*, which is in this analogous to *Brewin* of the Kurnai; but the latter lived in the sky, while the former was thought to live in the mounds of earth which are so often to be seen around the swollen stems of great forest trees. The *Ngarang* was described as being like a man with a big beard and hairy arms and hands. They came out at night in order to cast things at men passing incautiously. Their magic acted by making the victim lame. The wirarap was, however, superior, for he could extract these substances by his art, as quartz, bone, wood, or other rubbish. Of course, the *Ngarang* was invisible to all but the wirarap.

The Murring Gommera.

Among the Murring of the coast, the wizards (*gommera*) were the principal men, and in this the Murring differed somewhat from the Kurnai and the Woiworung, and probably from other tribes among those I have mentioned.

I have before said that the Kurnai headmen were not necessarily doctors or wizards. For instance, the principal man of the northern section of the Kurnai, when Gippsland was settled by the whites, was one Bruthen Munji,[2] who was a fighting man and orator. It is said of him as showing his eminence as a warrior, that he had been known to run down a straggling Brajerak blackfellow, and hold him until his brother Bembinkel came up and knocked him on the head. With the Woiworung, according to my informant, Barak, the headmen were those old

[1] Mr. McAlpine, whom I have already mentioned, tells me that about 1856-57 he had a black boy in his employment. The lad was strong and healthy, until one day, when Mr. McAlpine found that he was ill. He explained that he had been doing what he ought not to have done, that he had "stolen some female opossum" before he was permitted to eat it; that the old men had found it out, and that he should never grow up to be a man. In fact, he lay down under the belief, so to say, and never got up again, and died within three weeks.

[2] Kamilaroi and Kurnai, p. 212.

men who "spoke straight and did not injure people."[1] The wirarap might be a headman, but was not necessarily such. With the Murring, on the contrary, the headman must also be a wizard. This comes out clearly in considering what the gommeras and their powers were.

The power of a gommera was very great before the disorganization of the Murring tribes, although even now he directs and is obeyed. He was the headman and wizard combined. He was the *biamban*, or master, of all the people of the local group to which he belonged.[2] The oldest gommera was the *biamban* of the other gommeras, who obeyed his directions. He directed the proceedings of the *Bunan* and the *Kuringal* (initiation ceremonies), and to judge from the one I have seen, maintained a certain reserve and kept himself somewhat apart as being superior. To be a "real gommera," a man must have certain qualifications. He must be grey-headed, must speak several dialects, or even languages, he must be skilful in arms, and above all he must be able to "bring things up out of himself."[3] At the initiations, where the wizards exhibit their powers, sometimes singly, sometimes all together, the substances which they "bring up," and exhibit held between their teeth, are quartz crystals, or pieces of veinquartz, pieces of blackstone, white substances (pipe clay, &c.), lengths of fresh intestine, pieces of flesh, bone, &c. The accounts given of the Gommeras of the past generation, say thirty years ago, if fairly trustworthy, show that they were more clever than the men now living. One man was described to me as having attended a great *Bunan*,[4] coming from Braidwon, who protruded from his mouth, while performing his magical dance, a black substance about the size of a hand, which hung down from his mouth, and could be withdrawn and again protruded. It was believed that by exhibiting this to his enemies he could render their sight dim, and then go up and knock them on the head with ease. At the same *Bunan* it is said that another, during the dance at which the *totem* name, meaning "Brown Snake," is shouted, produced out of his mouth a small live brown snake, which his tribesmen believed

[1] Buckley says: "by my harmless and peaceable manner amongst them, I had acquired great influence in settling their disputes. Numbers of murderous fights I had prevented by my interference."—Morgan's "Life of Buckley," p. 101.

[2] In these tribes the local organization had superseded the social organization. The totems had lost their prominence and had sunk into "magical names" rather than names connected with descent.

[3] This expression refers to the belief that the wizards keep their magical substances "in stock," so to say, within themselves, and can at will bring them up out of their interiors, so as to produce them from their mouths.

[4] The *Bunan* is the complete ceremony of initiation, at which a circular mound of earth is made, within which some of the ceremonies take place.

to be what we may call his "familiar." A third gommera is said to have brought up a number of minute crystals of quartz, which, being dropped from his mouth into a wooden bowl, were given to the novices to swallow, in order that these crystals might "breed" inside them, and thus in time make them "clever men."

The gommeras were believed to go up aloft by threads, and this also applies to the wizards of the Maneroo Murring, the Ngarego, the Wolgal, and the Theddora of Omeo.

The ghosts were also, as elsewhere, in communication with the gommeras.

It seems to have been a favourite practice of the gommeras until quite recently to leave things lying about the *kuringal* (initiation) grounds. The general belief is that these are the substances which they can project into people, such as quartz, bone, &c. From one case which was related to me, it seems, however, most probable that they actually did leave sharp pieces of bone, which may have been poisoned. In the case I refer to, a young man walking across a *Bunan* ground, trod upon a sharp pointed piece of bone, became ill, and died. The symptoms described to me suggest blood poisoning. One then comes naturally to think of the statements which are made as to some of the South Australian tribes, namely, that the wizards used pointed bones, which had been left for a time in a putrid corpse, to kill people by scratching them.[1]

The belief in the powers of these gommeras held by the tribes people, and even by the younger men who have been much with the whites, is well shown by the statement of one young man to me. He said, "These gommeras can put poison into you, and also suck it out. I have seen one of them suck it out in a good mouthful of blood from a man. They can also find out who it is that has put poison into a person." The word "poison" is very generally used by the aborigines as we should use the word "magic" or "magical substance." Perhaps the best equivalent is the North American term "medicine."

The Kurnai Biraark.

A peculiar feature in the Kurnai magic is the separation of the functions of the seer and bard from those of the doctor and wizard as herein described. The Kurnai *biraark* combined the seer, the spirit medium, and the bard, for he foretold future events, he brought the ghosts to the camps of his people at night, and he composed the songs and dances which enlivened their

[1] "Native Tribes of South Australia," Adelaide, 1879. "The Narrinyeri," by the Rev. George Taplin. Sec. iii. p. 29. *Neilyeri*, or the poison revenge.

social meetings. He was a harmless being, who devoted himself to spiritual performances which resembled very strikingly those of civilised "mediums." I have already written about these men,[1] and a few words only now remain to be said of them.

One of the best remembered biraark was a man of the Brabra clan, named Mŭndauin. It is related of him that he became a biraark by having dreamed three times that he was a kangaroo, and as such participated in a "corroboree" of those animals. In consequence of this kindred he could not eat any part of a kangaroo on which there was blood. Nor could he even carry one home which had any blood on it. Others did this and gave him such pieces when cooked as he could eat. He said in reference to this that if he were to eat any kangaroo meat with blood on it, or touch the fresh blood of a kangaroo, the *mrarts* would no longer take him up aloft.

Mŭndauin said that after dreaming of the kangaroos he began to hear the ghosts drumming and singing up aloft, and that finally one night they came and carried him away. A man who was present in the camp on the occasion of one of his "manifestations," said as follows:—

"In the night his wife shouted out, 'He is gone up." Then we heard whistling in the air, first on one side of us, then on the other, and afterwards sounds as of people jumping down on the ground. After a time all was quiet. In the morning he found Mŭndauin lying on the ground near the camp, where the *mrarts* had left him. He had a big log lying across his back. He seemed as if asleep, and when we woke him up and took the log off him, he began to sing about the *mrarts*, and all he had seen up above."

At another *séance* by Mŭndauin the ghosts said finally, speaking in hollow, muffled voices, which my informant imitated by holding his nose when speaking, "We must now go home, or the west wind may blow us out to sea." In the morning the biraark was found as before lying on the ground outside the camp, and round about him were the marks of feet deeply stamped into the soil, where the *mrarts* had alighted.

Besides learning news from the ghosts about absent friends, and possibly present enemies, the biraarks were also material benefactors to their tribesmen, as when the ghosts informed them of a whale stranded on the shore. For it was thought that the whales were in such cases intentionally killed by the *mrarts* and sent ashore for the Kurnai.

At such times messengers were sent out, and all the surrounding people from far inland collected to feast upon the "food sent by

[1] Kamilaroi and Kurnai, p. 253.

the gods." No doubt at such times the biraark was not forgotten.

Powers such as these of the biraark were also attributed to the wizards of the Wotjoballuk and the Wirajuri, who were believed to be able to bring down the ghosts to the camp at night, so that the people could see their dim figures walking about in the gloom.

Magical Omens.

I have now noted the principal beliefs which have come to my knowledge bearing upon the powers and the office of the wizards and the doctors. A few words may conclude this section as to the omens and warnings believed in, and which are in some measure connected with magic.

I have several times mentioned a common belief that kangaroos can give warning of coming danger. A Murring young man, who served me as a messenger, in connection with initiation affairs, had a bag of powerful charms (*joëa*), which had been given to him to take care of by a gommera, his relative, and by other gommeras. Among these was one which he prized very highly, and on inspection I found it to be the top of a cut-glass stopper of some bottle. The use of these magical objects to the young man was in the manner of protective charms. When I asked him how they would protect him, he said, "If I were going along, and saw an old man kangaroo hopping straight towards me and looking at me, I should know that he was giving me notice that enemies were about. I should get my spear ready, and I should hold my *joëa* bag in my hand, so that if the man were to chuck something at me I should be safe." The throwing of the *joëa* is, in other words, the projection by some wizard of a quartz crystal or other magical substance. In this case the young man has the kangaroo for his *totem* (from his father). I may note, that "getting his spear ready" is a mere figure of speech for being prepared, for the Murring have long laid aside their native weapon, the spear, for the white man's gun.

The Kurnai also believe in kangaroo warnings, and for one to dream of a number of "old men kangaroos" sitting round his camp, is to receive a serious warning of danger.

It was a practice with them to consult the crow in times of danger, by saying to it, "Which way shall I go?—north, south, east, west?" When the bird croaked "*Nga-a-a*" (yes) the oracle had spoken, and the omen was accepted. One of the nightjars has a note which the Kurnai say is "*borūn-borūn*," or "jag spear, jag spear," and indicates that enemies are about. The note of another bird—which I have now unfortunately forgotten—indicates the arrival shortly of some one.

A Kurnai hearing a cracking sound in the ground under his head when lying in his camp by fire at night, would consider that the ground was giving him warning against some danger near at hand.

In all tribes with which I am acquainted, the lives and actions of the people are much influenced by such omens as well as by dreams.

Doctors' Fees.

It goes without saying that the wizards and doctors in all these tribes did not exercise their powers gratis. Presents were given them by people who had benefited by their art, and also by people who feared lest they should suffer from it. They received presents of weapons, rugs, implements—in fact, of all those things which are of value to the aborigines, not forgetting a share of the game caught. Especially did they reap a harvest at the great gatherings. The *Bunan* gatherings of the Coast Murring may be taken as an example. Before the people separated to return home, a sort of fair or market was held, to which people brought the weapons, rugs, implements, &c., which they had brought with them for the purpose.[1] From these "fairs" the gommeras went away loaded with gifts.

IV.

How Men became Doctors or Wizards.

The subject of this section I have found to be one of almost insuperable difficulty. The blackfellow doctors surround themselves with profound mystery and of course give the account of themselves which best suits their purpose. The relation which these statements, as current in the tribe, bear to the truth, is no doubt the same as that of the proceedings at initiations given to the women and children in relation to the true proceedings What these latter are the reader can learn by reference to my two communications to this Institute.[2] The statements made to the women are that *Daramulun* comes down in person and knocks the boy's tooth out (Murring, Ngarego, Theddora, Wolgal, Wirajuri), that *Turndun* comes down and makes the boys into men (Kurnai).

On the Lower Lachlan and the Murray the novice is said to meet *Thrumalun*, who kills him and brings him again to life.

In one part of Queensland the sound of the Bullroarer is said to be the noise made by the wizards in swallowing the boys and bringing them up again as young men. The Ualaroi of the

[1] This fair has fallen out of use at the present time.

[2] "On some Australian Ceremonies of Initiation" and "The Kurnai Jeraeil."

Upper Darling River say that the boy meets a ghost which kills him and brings him to life again as a man.

So it is with the doctors and wizards. The tribes are full of tales of the manner in which these men acquire their terrible powers.

As I have said, I have found the elucidation of this subject most difficult, and I have not succeeded in working it out at all to my satisfaction. The wizards of "the olden time"—that is, of the time before the tribes became "tamed" by the whites—soon die out blighted by our civilisation, or they linger on and either shut themselves up within themselves or give themselves up to rum and its consequences.

The second generation of blackfellow doctors loses much of the old practice of magic, and by-and-by these die and the race becomes extinct, and only shows now and then in some old man who has partially retained some of the magical practices of the old time. Such has now become within the last few years the condition of the Kurnai, and it will be the same with every Australian tribe as the wave of civilisation rolls over and crushes it.

The Kurnai belief is that the doctors (*Mulla mullung*) obtained their powers in dreams. Either the ancestral ghosts visited the sleeper and communicated to him protective chants, or they took him in spirit with them and completed his education elsewhere. Tulaba is a case of the former,[1] and Tankli, the son of the Lace Lizard, is an instance of the latter, as I shall relate further on.

The wizard of the Kurnai appears in the form of the *biraark*, a harmless being who was the medium of communication between the ghosts and the tribe. It will be seen that the account given of himself by Tankli combines both the beliefs as to the manner in which men became doctors or spirit mediums.

The Wotjobaluk believed that a man became a *bangal* (wizard) by meeting with a supernatural being, called by them *Ngatje*, who is said to live in the hollows in the ground in the Mallee Scrubs. They think that the Ngatje opens the man's side and inserts therein such things as quartz crystals, by which he obtains his powers. From that time he can "pull things out of himself and others," such as quartz, wood, charcoal, and also from his arms "something like feathers" which are considered to have healing properties.

The Woiworung also believed that their wiraraps were instructed by the ghosts who conveyed them to the sky through a hole to *Bunjil*, from whom they received their magical powers.

The Murring of the coast considered that it was Daramulun who gave their powers to the gommeras, but at the same time

[1] See p. 39.

thought that a boy could be trained up "in the way he should go"—that is, in magical ways. A great gommera, called by the whites Waddiman, that is to say, "Tree climber," who died only a few years ago, is reported to have said that he was trained up as a boy by a very great gommera of that time. As Waddiman died at a great age, his training took place probably some sixty years ago. He also said that he got his magical powers from Daramulun.[1]

The Ngarego, Wolgal, and Theddora held the same belief as to Tharamulun being the source of the magical power of their wizard.

The Wirajuri wizards professed to go up to *Baiame* for their powers.[2] But the wizards also in this tribe trained up their sons to follow in their steps. The account which I subjoin was given to me by a Wirajuri of the kangaroo totem of the Muri sub-class, and is an excellent example of the beliefs held in such matters.

This narrative was given voluntarily during a conversation I had with him about the initiation ceremonies of his tribe. He had been careful not to betray anything unlawfully until he found out from my answers to him that I was indeed one of the initiated. He then became quite communicative and gave me a full account of the Wirajuri ceremonies (*būrbŭng*), and in many respects I was able to check his statements and found him to be quite accurate. He then, when we were talking about the magical exhibition of the wizards at the ceremonies, said, "I will tell you about how my old father began to make a black-fellow doctor of me." My impression is that his account was *bonâ fide*, and from my experience I should say that it would be an unheard-of thing for a man to falsify when speaking of matters relating to such sacred subjects as the initiation with an initiated person. I mention this because I have not been able to verify his statements. Up to the present time I have not succeeded in placing myself in communication with the old man, his father, who is believed to be still living on the Lower Murrumbidgee River. I now give his account in his own words as far as possible, and I leave it to my readers to form their own opinion as to its value:

"My father is Yibai—Iguana.[3] When I was quite a small boy he took me from the camp into the bush to begin to train me

[1] As to Daramulun see "On some Australian Beliefs," and "On some Australian Ceremonies of Initiation," Journ. Anthrop. Inst., vol. xiii. p. 192, 432, &c.

[2] Baiame is the analogue of Daramulun or Bunjil, or Munganngaura, the supernatural being to whom the aborigines attribute the institution of their social organization, and the invention of their arts.

[3] *Yibai* = *Ipai* of the Kamilaroi.

to be a *wulla mullung* (doctor or wizard). He placed two large quartz crystals against my breast, and they vanished into me I do not know how they went, but I felt them going through me like warmth. This was to make a clever man[1] of me and able to bring things up. He also gave me some things like quartz crystals, in water. They looked like ice, and the water tasted sweet. After that I used to see things that my mother could not see. When out with her I would say, 'Mother, what is that out there, like men walking?' She used to say, 'Child! there is nothing!' These were the *jir* (or ghosts) which I began to see.

"When I was taken to the Burbung[2] and had seen what all the old men could bring up out of themselves, and when my tooth was out I went into the bush for a time, and while there my old father came out to me. He said, 'Come here to me,' and he then showed me a quartz crystal in his hand, and when I looked at it he went down into the ground and came up all covered with red dust. It made me very frightened. He then said, 'Come with me to this place,' and I followed him into a hole leading to a grave where there were some dead men who rubbed me over to make me clever, and who gave me some quartz crystals. When we came out my father pointed to a tiger snake, saying, 'That is your Bŭdjan.'[3] There was a string tied to the tail of the snake. It was one of those strings which the doctors bring up out of themselves curled up together. He took hold of this string, and said, 'Come, follow him.' The tiger-snake went through several tree trunks, which opened and let us through. Then he came to a great Currajong tree[4] and went through it, and afterwards to an immense tree with a great mound round the roots.[5] It is in such places that Daramulun lives.[6] Here the tiger-snake went down into the ground, and we followed him and came up under the tree which was hollow. There I saw a number of little Daramuluns. After he came out again the tiger-snake took us to a great hole in the ground which was filled by a lot of tiger-snakes, which rubbed themselves against me, but did not hurt me, being my Bŭdjan. They did this to make me a clever man and a *wulla mullung*.

"My father then said we will go up to Baiame's camp. He got astride of a thread and put me on another, and we held by each other's arms. At the end of the two threads was Wombū the

[1] To be a "clever man" is the phrase used for being a wizard.

[2] Initiation ceremony.

[3] *Bŭdjan* = totem. The tiger snake is his secret totem; his own by inheritance through his mother is kangaroo.

[4] *Brachychiton populneum*.

[5] See the Ngarang of the Woiworung.

[6] The Wirajuri say the Daramulun is the son, or one of the sons, of Baiame.

bird of Baiame. We went through the clouds, and on the other side was the sky. We went through the place where the doctors go through, and it kept opening and shutting very quickly. My father said that if it touched a doctor as he was going through it would hurt his spirit, and when he returned home he would sicken and die.

"On the other side we saw Baiame sitting in his camp. He was a very great old man with a long beard. He sate with his legs under him and from his shoulders extended two great quartz crystals to the sky above him. There were also numbers of the boys of Baiame and of his people who are birds and beasts.

"After this, while I was in the bush, I began to bring up things, but I became very ill, and cannot do anything since."

There are some things to notice in connection with this man's statement which I shall defer until the concluding section of this paper.

The account which was given me by Tankli of the manner in which he became a *wulla mullung* is as follows. I have kept to his own language as nearly as possible:

"When I was a big boy, about getting whiskers, I had some dreams about my father. He came to me with a number of old men. I was at that time camped with my people at Tarraville,[1] and Morgan and other old men were there. When I first dreamed my father and the other men who were with him stood round me. They were all rubbed over with red ochre, and they made me hold a cord made of sinews, and they swung me about on it. After that when they came once or twice they were dressed as if for the *jeraeil*.[2] My father put a cord of sinews round my waist and under my arms, and he and the old men carried me by it over the sea at Corner Inlet, and set me down at Wilson's Promontory in front of a big rock like the side of a house. I noticed that there was something like a door which opened and shut very quickly. My father tied something over my eyes and led me into the rock. I knew this because I heard the door make a sound of shutting to behind us. Then he uncovered my eyes and I found that I was in a place as bright as day, and all the old men were round about. My father showed me a lot of shining bright things on the wall and told me to take some. Then we went out again and he taught me how to make these things go into my legs, and how I could pull them out again. He also taught me how to throw them at people. After that he and the other old men carried me by the cord back to the camp and put me in the top of a big tree.

[1] In South Gippsland.
[2] Initiation ceremonies of the Kurnai.

He said, 'Shout out loud, and tell the people you are come back.' I did this and I heard the people in the camp waking up and the women begin to beat their rugs. Then old Morgan and the old men came out with firesticks, and when they reached the tree I was down and was standing by it on the ground, with the thing my father had given to me in my hand. It was like glass and we call it *kīn* (quartz). I told the old men all about it, and they said I was a doctor. From that time I could pull things out of people, and I could throw the *kīn* like light in the evening at people to hurt them. I have caught several in that way. About three years ago I took to drinking and I then lost my *kīn* and all my power, and have never been able to do anything since. I used to keep it in a bag of ringtail 'possum skin in a hole in a tree. One night I dreamed that I was sleeping in my camp and that my wife threw some *krūk*[1] on me. After that I never could do anything, and my *kīn* went out of the bag, I do not know where. I have slept under the tree where I left it, thinking that my power might come back, but I have never found the *kīn*, nor can I dream any more of it."

V.

Conclusion.

The general belief of the aborigines as to the powers of the wizard are much the same in all the tribes herein spoken of. He is everywhere said to have received his dreaded powers from some supernatural source, from the ancestral ghosts, or from Daramulun, Baiame, or Bunjil. In all cases he is credited with the power of seeing man in an incorporeal state, either temporarily or permanently separated from the body, as a ghost which is invisible to other eyes.

He can, it is thought, ascend to ghost-land beyond the sky, or can transport himself or be transported by the ghosts from one spot of earth to another at will, much after the manner of the Buddhist Arhat. The powers thus conferred upon him he can use either to injure or destroy men, or to preserve them from the secret attacks of other wizards. He can also, it is thought, assume animal forms and control the elements. In these beliefs as to the powers of the blackfellow doctors, we find a striking resemblance to those which have been held concerning wizards, sorcerers, and witches in the past in those parts of the earth as to which we possess records, as well as to those beliefs common to savage peoples all over the world at present. Nor can it be said that they have altogether died out even in the most civilized races.

[1] Menses.

Some of the practices of the Australian wizards are not only found in all the tribes I have dealt with herein, but they extend throughout the Australian continent. For instance the use of the quartz crystal and of human fat. The use of the transparent crystals of quartz is also world-wide for magical purposes, and may perhaps have been handed down from the most distant times when our own ancestors were savage. It is difficult to say why it should have been so universally fixed upon as peculiarly fitted for the practice of magic; but it is open to conjecture that it may have been, as with the Australian savages, on account of its peculiarly clear and waterlike appearance, which had attracted attention and caused feelings of wonder.

The practice of fat-taking in the form in which the belief is found, seems also most difficult to explain and account for. After considering all the evidence before me, I have thought that it may perhaps have been the outcome of the combined effect of two beliefs, which are held by the blackfellows. One is as to the nature of dreams, and the other as to the position which fat holds in the human economy.

It has become pretty clear to me that many beliefs of the Australian savage have arisen out of attempts by his ancestors to account for phenomena which they have perceived both around and within themselves. I have been forcibly struck when travelling in the wide, open, and level stretches of the interior of the continent by the apparently self-evident view which the earth and the sky suggest of a flat surface and a vaulted covering. The Australian savage holds this to be the actual fact, and it cannot have seemed less patent or less reasonable to his ancestors. He attempts to account for the space between the earth and the sky by saying that at one time they touched each other, that is to say, the sky lay on the earth, and that the magpie,[1] who was at that time a man, pushed up the former with a stick so that the sun could commence his ceaseless course.[2] When the sun goes down at evening into the glow of sunset, he explains the phenomenon by saying that he has gone into a place resembling a glowing cavity, out of which a tree stump has been burned.[3] It is by such explanations that he endeavours to account for natural phenomena which have excited his curiosity—a spirit of inquiry into the surroundings which is inherent in man, and not only in him but in a decreasing amount as we trace back the chain of animated nature.

How such views as the above have been so strongly held by

[1] In the Wotjobaluk language *Gorĕk*.

[2] The sun is a female, according to the Wotjobaluk, seeking daily for her little boy whom she had lost while digging for yams.

[3] Wolworung tribe.

our own ancestors, is well shown by the impress of primitive thought upon language which has compelled me, at the time unconsciously, to use words which in fact imply that the sun moves from east to west, and sinks beyond the western edge of the world:

> "Then we upon our globe's last verge shall go
> And view the ocean leaning on the sky.

When at night the blackfellow sleeps by his camp fire, and has dreams, he explains them by saying that while his body lies motionless, he himself is able to wander abroad, and to do or to suffer. He even attempts to fix the precise time by explaining another phenomenon by saying that the human spirit goes upon its nocturnal wanderings when the sleeper snores.[1] When waking he is conscious that he exists, together with his body, and he calls his self-consciousness by some name, such as the Kurnai word "Yambo." During waking moments he and his body are inseparable, but during sleep he can leave it and wander abroad and then meet the spirits of other people, of those he knows, of strangers, and even of the dead.

Thus this view of the reality of dreams, enables the Australian savage to reach, by a natural stage of reasoning, a conception of the individual apart from the body, not only during life but also after death, as an immaterial, invisible being, for who can see the Yambo leaving the sleeper? Yet it is visible to other sleepers as the experience of every blackfellow will assure him.

No distinction separates this belief from another, namely that some persons are even so gifted as to be able to see the disembodied spirit sitting by the spot where its body lies buried, and no longer able to resume its accustomed habitation. These peculiarly gifted seers lead direct to the doctor and the wizard.

In dreams, the blackfellow visits the vaulted sky beyond which lies the mysterious home of that great and powerful Being, who is Bunjil, Baiame, or Daramulun in different tribal languages, but who in all is known by a name the equivalent of the only one used by the Kurnai, which is *Mungan ngaur*, or "Our Father." In dreams he sees the dead peopling that land of trees and streams, and he naturally finds among them those old men who directed the tribe on earth, and who now only remain there in reverential memory.

It seems to me that this belief in the reality of dreams, as regards the human self-consciousness gives a key to many universal beliefs which otherwise seem almost inexplicable.

[1] Woiworung tribe. Mr. Fison tells me that this is also a South Sea belief, where a peculiar snore denotes this state.

The second belief to which I have referred as having probably reacted with the notion of the reality of dreams in producing the practice of Bukin is that as to the nature of human fat. I find a general belief that there is some connection between a man's fat and his strength and vitality. Health, strength and fatness seem to be directly connected, and, therefore, the wasting of the body and disease to be the result of the absence of fat, and perhaps followed by death. The belief that a man's vitality and his fat have some connection, is shown by the widespread practice of eating the fat of deceased persons and of enemies slain.[1] I have given an instance of such a practice among the Kurnai. By eating a man's fat, and thus making it part of himself, the blackfellow believes that also acquires the strength of the deceased. So it is also that the human fat brings in hunting, causes spears to fly true to their mark, or the club to strike irresistible blows.

It is a common belief that when two things are associated together any magical power possessed by one will be communicated to the other. For instance, when returning from the Murring Kuringal, I was the custodian of the teeth which had been extracted from the novices, and the old men earnestly besought me not to carry them in the bag in which they were aware I had some quartz crystals. They pointed out that if I did so, the magic of the quartz crystal would pass into the teeth, and injure the boys. I might continue with a number of such illustrations of the belief in the "spiritual" influence, if I may use such an expression of one substance through another upon a third.

The possession of human fat is, therefore, much desired by the aborigines, especially those who feel age or disease, and those who desire to be successful in magical arts.[2] The desire to obtain it leads to the killing of aliens, or even, in some cases, of people of the same tribe. The practice of taking fat is a real one, and as such would most certainly become part of the stock of dreams of the blackfellow, who believes that the wizards, especially those of inimical tribes, are always on the look out for chances to take fat, either by direct violence or invisibly by

[1] For instance see Gason's remarks as to the eating of human fat by the Dieyerie. "The Dieyerie Tribe" by Samuel Gason, Adelaide, 1874: also "Native Tribes of South Australia" Wigg, Adelaide, p. 274.

[2] The desire to use the influence of those portions of the human body in which the aborigines believe the vital strength to reside leads them to use, not only fat but also other sources of strength which it is hardly possible to explain in direct language. So far as I know at present, the practice I refer to occurs in a Cooper's Creek tribe and also as lately described to me by Mr. C. M. King, the Police Magistrate at Milparinka, in New South Wales, in the tribe at that place. All that I can now say is that it seems to be connected with the peculiar practice in some tribes of slitting the urethra.

means of some of their terrible secret arts. A blackfellow suffering from nightmare, dreams in accordance with his waking beliefs and experiences. An evil ghost has seized his foot and is about to drag him out of his camp, or the *Bret-bung* has caught him at last and is about to extract his fat (Kurnai). What can seem more horribly real than such subjective impressions. A white man who has had nightmare, and has dreamed that he has fallen helplessly into the hands of garotters can realise how irresistibly truthful analogous dreams must seem to the blackfellow and that sometimes he actually dies after a succession of such dreams, from what seems to be nervous collapse.

I think we may feel sure that the belief in the supernatural powers of the wizards rests in part upon the effect of dreams upon the aborigines, and partly upon the want of knowledge by them of the true nature of disease. They naturally attribute disease, which is not the normal state of the sound human body, to supernatural influences, in their attempts to find an explanation. A Kurnai suffering from bronchitis, and seeking for a cause, finds one in the semblance of his sensations to what he might expect to feel if his chest were stuffed up with the charred dust which falls from the "fire drill." He says, therefore, that Brewin or some blackfellow doctor has filled him with "Tŭndūng." A Wotjobaluk who suffers from some form of fever and who has delirious dreams, in which he sees the fantastic actions of people conjured up by his fevered brain, receives this as a clear proof that one of these people has burned something appertaining to him. These instances will suffice to illustrate my meaning, but they might be multiplied indefinitely.

The most difficult question which I have had to deal with in this inquiry has been to determine how far the doctors and wizards believe in their own powers. All explanations concerning them must be given by the tribes-people or by themselves, and if the latter one has to distinguish between those explanations which are truthful and those others which are not, and which have been made for the purpose of blinding the tribe. Herein lies the great difficulty. The class of blackfellow doctors is almost extinct in the tribes of which I have a personal knowledge, to which I have access and in which I am so well known, that the old men do not, when questioned, shut themselves up in a reserve which often successfully simulates dense stupidity. The "real old gommeras" of the Murring became extinct when Waddiman died a few years ago. The last biraark of the Kurnai was killed twenty-five or thirty years back. The Woiworung and Jupagalk wirarap and bangal have been all

dead I do not know how long. There only remain, so far as I can learn, two old men, wizards of the olden time, within that part of Australia covered by the inquiries noted in this paper. One of them wanders somewhere between the Wimmera and the Murray rivers, the other on the Lower Murrumbidgee, the Yibai-Iguana, whom I have already mentioned in these pages. As yet I have failed to meet with them, and for all I know these two old men may even now have gone from the land of their ancestors to the "ghost-land" of Baiame.

The blackfellow doctors as a class naturally surround themselves with mystery. Their magical practices are not favoured by too open examination, and the more that is left to the active imaginations of their tribe, the better their assertions are received. But within the inner circle of initiated I have found so far that there is but a thin veil cast over the arts magic which are performed in public.

The doctors and wizards in these tribes are, with few exceptions, conscious pretenders and impostors. The very few who believe that they are able to effect cures by charms received in dreams are men like Tulaba. As for the others, I have a good example in two old Murring men, who came to see me some twelve years back, and who still have a great reputation as being very powerful wizards and doctors. To me these men do not profess to be able to do supernatural acts, but the tribesmen have ocular evidence, for they have seen them "bring up things out of themselves" at the Kuringal. As I have already stated one excused himself for no longer having that power by having "drunk too much grog" which had spoiled his *joëa* (magic); the other smiled and said that he had drunk too much tea. When these men came to see me they brought a number of the Murring. Being friendly with the Kurnai, the were also much with them. One of these being ill consulted one of the Murring doctors who, after manipulating him, sucked the afflicted place, and exhibited a quartz crystal as being the cause of the ill. He also told the patient that it had been thrown at him by the other Murring doctor. The man got well, and the reputation of the two old men was greater than ever. It was, however, a very dangerous game to play, as had the man died, the evidence would have been conclusive.

As to the two men, Tankli and Muri-Kangaroo, the case is somewhat different, and they represent a class which was larger in the tribes formerly. Granting all that can be said as to the intentional fraud of the blackfellow doctors, and admitting that many of them are mere cheats and frauds, there remain some who really have a belief in their own powers as well as in those of other men. I feel strongly assured that both the Kurnai and

Wirajuri men believe that the events which they related were real, and that they actually experienced them.

As to Tankli, it seems to be most probable that his case has been one of nervous exaltation combined with somnambulism and that upon the "subjective realities" in that state he has built up a structure of deceit in his practice of his curative art. That he believes also in the reality of his dream which he says caused him to lose his *kīn* and his magical powers seems most probable, when one considers that he has voluntarily relinquished the practice of an art which brought him great consideration.

The case of Muri-Kangaroo seems to me to point to the practice of some form of hypnotism among the old class of wizards. The youth at the time of initiation is in a peculiar and abnormal mental state. He is fed full of magical ceremonies and beliefs. He has undergone fearful and impressive ceremonies, and is in a condition which would be peculiarly fitted for the practice of hypnotism.

One can understand that a youth who had passed through such an experience could never doubt the reality of the magic powers of others, even when himself conscious that he had no such powers.

The difficulty I see in this view, is, however, that so far as I know, persons who have been hypnotised, and thus brought under the influence of waking dreams, do not afterwards remain conscious of the subjective events of that state.

Discussion.

Mr. Lawrence Gomme observed that although he had not expected, as a visitor, to be called upon to speak, yet he had noted one or two facts which the paper had brought out and which it was interesting to emphasize. In the first place it must be noted how the office of wizard or medicine man was distinctly an academic office, if such a term might be used of camp society. He meant by that expression that aspirants to the office had to undergo some preparation or special training and had to possess special faculties. This feature alone made a clear distinction between the superstitions of witchcraft and the generally current popular superstitions which did not depend upon specially appointed advocates. Mr. Gomme noted that the Australian blackfellow doctor was supposed to obtain his medicinal objects from his own stomach or inside, whereas if the researches of Dr. Callaway in Africa were consulted, it would be found that the Zulu wizard obtained his magic medicines from the ground and that great skill and training was supposed to be required to be able successfully to find these objects. On the whole Zulu witchcraft was a much more systematic cult than the Australian, and it was a question whether the Australian

really believed all he practised or had passed forward to the stage of unbelief. Mr. Gomme thought that he really believed in his own powers. Another feature prominently brought out by Mr. Howitt's paper, was the custom of repeating rhyming incantations. This was a subject that Mr. Gomme said he had paid considerable attention to and had made large collections of examples and it was curious how nearly everywhere much virtue was supposed to exist in the formulæ being in rhyme. Mr. Howitt's paper was particularly valuable because it was the personal observation of a traveller, and his notes would form a substantial addition to the already extensive literature of witchcraft.

Major E. CECIL JOHNSON, F.R.Hist.S., remarked that one of the most interesting points in the paper was the allusion to crystal as one of the substances supposed to be extracted by the "medicine men" or "wizards" from the bodies of their victims. Crystal had been associated from time immemorial in some mysterious way with the assumption of supernatural powers. We find it mentioned by medicinal writers in the black art as one important factor in the unholy rites of witchcraft. We find it credited with magical properties amongst the Jadoogars of India, we find it used by Cagliostro in recent times, and by modern mesmerists in electro-biological experiments.

Mr. RUDLER also made some remarks on the superstitions associated with rock crystal. Pieces of crystal are occasionally found in barrows, and seem to have been valued as amulets. He alluded also to the divining ball of Dr. Dee, which was a sphere of rock crystal now preserved in the Mineralogical gallery of the British Museum (Natural History).

The following paper was taken as read :—

NOTES *on the* NUMERAL SYSTEM *of the* YORUBA NATION.

By ADOLPHUS MANN, Esq.

OF late, the nations and languages of West Africa have largely occupied the attention of the learned linguists of Europe, and grammars and vocabularies are being published in considerable number. By means of the laborious work of Mr. Rob. N. Cust on "The Modern Languages of Africa," the classification of the four or five hundred languages has been advanced to such an extent as could not, some years ago, have been expected. Perhaps the following notes on the numeral system of the Yoruba nation may interest the student of ethnology and languages, and may be of some use in investigating the nature of the mind that can form such an unusual, yet regular structure. A superficial knowledge, with a slight attempt of praxis, suffices to understand peculiarities in the arrangement of these numerals, to which

analogies in other languages are but rarely found. We light, as it were, on a building, which, when viewed from base to summit is not behind our European systems in regularity and symmetry, while the system surpasses them in the aptitude of interlinking the separate members; it stands to them in the same relation as the profusely ornamented Moorish style stands to the more sober Byzantine.

The numerals of all nations are formed on the basis of the radical units, with one or two original terms, by the help of addition and multiplication we get all we want. One added to ten, and hundred and thousand properly joined together make up a complete system. Very different is the framework of the Yoruba, it can boast of a greater number of radical names of numerals, and to a large extent makes use of subtraction, which, in the Aryan languages we find employed only in the Latin *unde* and *duode viginti*, &c., &c., and which could not find a place in its Romance sister-tongues, whilst only a few Greek authors paraphrase subtraction with the verb δέω, *opus habeo, indigeo*; as δυοῖν δέοντες πενεήκουια ἄνδρες or μᾶσδεούσαις εἴκοσί ναυσίν. Here subtraction is of a sporadic occurrence; in the Yoruba it enters so fully into the system as the third power with addition and multiplication to make up the file of numbers that we are tempted to ask, Where is division?

As it is not intended to write a paragraph of a grammar but rather an ethnological sketch, the language shall be introduced as little as possible, but it cannot be left out altogether; however, the structure can be understood by the arithmetical combination by which it is represented, and which in itself is very interesting. I shall give first the names of the units, and then the nouns serving as numerals, and beg to observe that I am using the alphabet employed in the literature the language has attained to.

1, *Eni* or *ọkan*; 2, *eji*; 3, *ẹta*[1]; 4, *ẹrin*; 5, *arun*: 6, *ẹfa*; 7, *eje*; 8, *ẹjọ*; 9, *ẹsan*; 10, *ẹrva*; further 20 *ogun*; 30, *ọgbọn*; 200, *igba*; 400 *irinwo* or *irino*; 2000 *ẹgba*. *Eni* (1) enters only into the formation of *ekini* (the first): in other compositions *ọkan* is used; the first syllable of these words is a prefix that can be thrown off, and enters into contraction when a vowel precedes. These words are radicals with the exception of *ẹgba* 2000, which is a compound, but it does service as if it were a radical. It would be difficult to find out their meanings, the natives give none; the second syllable is in the form of the verb, but the first question would not be What is the meaning of the verbal word? but, Which of three roots is it? for we have three different tones on

[1] ẹ=e in met; ọ=law.

the root of the same sound, *jì*, *ji*, and *jí* low, middle, and high tone. Even if this point were settled, strong doubt would still fall on the connection between the meaning of the root in ages past and present. As cardinals, these words convey to the Yoruba ear and mind two meanings; first, the number and then the thing the Yorubas especially count, and this is money (shells) *Cypraea moneta; owo* in Yoruba, cowries in English. If the *first* syllable is emphasised, the meaning of the word is, 1, 2, 3, 4, &c., cowries, therefore on the question How many cowries? the answer is given in these radicals. Other objects are counted only in comparison with an equal number of cowries, for a nation without literature and without a school, knows nothing of abstract numbers. The ordinal numbers are formed as: *ek-ini* the first, *e* is prefix, *k* stands for *ka*, to count; but the numbers 20, 30, and all multiples of 10 do not take *ek*, but form the ordinal by placing the number after the object counted. The adjective numeral is formed by prefixing the number with *mu* (to take), but the *u* is always thrown out; *ọkan* can not take *m* when alone, just so 20, 30, and all multiples of 10, but when a unit precedes 10, the unit takes the *m* as: *eniam ejilelogun* that means twenty-two persons: but *ọgun enia* twenty persons; this *m* explains the *meji*, *mẹta* in the polyglottas of Clarke and Koelle.

Proceeding now to the compositions, we meet the simplest form in 11, 12, 13, 14 = 1, 2, 3, 4, plus 10. Here it must be observed that the language has a great ability to reduce composite terms of numerals to short ones, *e.g.*, 1 plus 10 is in words *ọkanlelịẹwa* which turns out to be *ọkanla*, &c. We shall find 10 *ẹwa* making an important figure as a long *a*.[1] Between 14 and 15 a break, as it were, takes place, 5 is never added to 10, but regularly subtracted from the following next higher tenth, and 4, 3, 2, 1, follow in its wake. We say therefore, 15, 16, 17, 18, 19 = 5, 4, 3, 2, 1, minus 20 and so on in every case of 5, 4, 3, 2, 1, before the next higher tenth, whilst 10, 20, 30 + 1, 2, 3, 4, are formed by addition; in both cases, addition and subtraction, the smaller sum is preceding the larger one. The word for addition is *le*, to be over, to be more: that for subtraction is *di* or *din* by dialectical difference, to lessen. Both verbs throw off the vowel when a vowel follows; if the smaller sum is placed after the larger one, it must be joined to it in a proper sentence with the verbal pronoun, it is more, *o le*, it is less, *o di*; the words for 1, 2, 3, 4, 5, are never shortened with the exception of 5, in 15 and 25 where *arun* 5 is replaced by *ẹ* (like e in met) thus *ẹdogun* for *arun dilogun*; by this rule we find that the numbers between every

[1] In the words 50, 70, 90 *ewadi* (10 from) turns *ãd*.

tenth are formed of a line of addition and one of subtraction. We must now see how the tenths are built up. We proceed from 20. *Ogun* in composition *og* or *ọg* sometimes even *ọ* as the first number that admits of multiplication; going on thus: 20 × 2, 3, 4, up to 20 times 9; but we must ask how are the numbers formed which are not even multiples of 10, such as 30, 50. Here, again, subtraction steps in. We have 50 = 20 times 3 minus 10; (20 × 9)—10 = 170; 50 *adota* = *ewa diliogola* = (20 × 3)—10, 20 × 5 = 100; (20 × 6)—10 = 110, &c., but thirty has a word of its own, namely, *ọgbọn*; of its etymology I could hear nothing. With 80 = 20 × 4 compare the French *quatre vingt*, the only instance of this form in the European languages.

With 185 we meet a new word, and with it a new factor of multiplication: it is *igba*, 200, for we say, 185 = (200—10)—5. 200 is a sum of money that owed its origin to the way in which cowries are counted and collected (swept) together (*gba* means to sweep, *gbalẹ*, to sweep the floor, therefore *igba* is money that is swept together). Here we may explain the origin of this somewhat cumbersome system; it springs from the way in which the large sums of money (cowries) are counted. When a bagful is cast on the floor, the counting person sits or kneels down beside it, takes 5 and 5 cowries and counts silently, 1, 2, up to 20, thus 100 are counted off, this is repeated to get a second 100, these little heaps each of 100 cowries are united, and a next 200 is, when counted, swept together with the first. Such sums as originate from counting cowries are a sort of standard money, 20, 100 and then especially 200, and 400 is 4 little heaps each of 100 cowries, or 2 each of 200 cowries, representing to the Yorubas the denominations of the monetary values of their country as to us ½*d.*, 1*d.*, 3*d.*, 6*d.*, 1*s.*, &c.: from the habit of counting 5 and 5 the fashion of subtracting may have taken rise, from the first lowest sum of uniting 5 and 5, that is 20 = 5 × 4 that of multiplying 20; the nature of the action, joining by a sweeping motion of the hands the 2 heaps of 200 each, suggested the new term *igba* and a number of such heaps lying about on the ground shows the fitness of multiplying 200 with smaller numbers as an easy way to rise to higher sums. Moreover, it must be borne in mind that in trade only sums which are multiples of 5, 10, 15, 20, &c., may reasonably be asked as fixed prices by which the reckoning is made up; sums lying between 5 and 10 are not to be thought of, negotiations of higher values *e.g.*, of 600 cowries are carried on upon the same principle, as, for instance, the seller will ask 1000 cowries, the buyer will propose 900, &c.: thus the inconvenience of cumbersome numerals is not felt in trade affairs, and when intermediate sums are to be named the expression in words always proceeds upon addition to or sub-

traction from the next standard sum, *e.g.*, 777 = (200 × 4)—23. We should expect a regular progress from 200 onwards. However, the first multiple of 200 (400) is not formed upon this rule; it is *irinwo* or *irino*. Unable to find a derivation of the word, I suppose it is as much as *ęrin owo*; this cannot mean 4 cowries, but can carry an allusion to the 4 heaps of cowries which are counted, each having 20 × 5, or to the 2 heaps of 200 each, either 4 heaps of 100 or 2 of 200 each being united, for 400 is in counting cowries a principal sum; 5 heaps of 400 make 2,000, or in English one head, the chief standard sum by which cowries are bought or sold against silver and gold. From 400 is derived 300; *irino di ọgọrun* becomes *ọdun*—300, a sum that, as the half more of 200, finds frequent application; compare 1*s.* 6*d.* The tenths between 200 and 400 and 500, &c., are framed by addition or subtraction 190 = 200—10 and 210 = 200 + 10: in the words of the language the smaller sum precedes the larger one, but the sound *o* (as in *law*) will not well afford a contraction with *le* = more, or *di* = less, therefore the composition with 300 (*ọdun*) would be 300 *o le* 10, &c., which sounds more fluent, *e.g.*, 355 would be framed thus: 300 *o le* (20 × 3)—5, but we would form 360 by subtracting 40 from 400, &c. In the same way the tenths beyond 400 are given by addition, 400 + 10, 400 = 50, but in 460 subtraction would be preferred, 500—40, in words 40 from 500 *ọ̀ji di lẹ́ẹ̀gbẹ̀ta*—40—(100—200 × 3). In the words for 500, 700, 900, 1,100, 1,300, 1500, 1700, 1900, we have 100 deducted from the next higher multiple of 200 × 3, 4, 5, to 15. As in 15 and 25 *ẹ̀d* stands for *arundilogun* and *arundilọgbọ̀n*, so in each uneven multiple of 200, *ẹ̀d* stands for 100 from 600, 800, 1000, 1200, &c. It is true the proper term would be *ọ̀d* = 100 from 600, 800, &c., (*ọgọrund*), but the strength of euphony of sounds is so overcoming that *ẹ* is preferred on account of the following *ẹ*, *e.g. ẹdẹgbẹ̀ta—ọgọrun di igba-ẹta*; with 200 × 10 we have reached the highest sum which is a factor for a further rise in numbers, *e.g.*, 200 × 10 = *ẹgba* 2000, from which the system forms 2000 × 2 = 4000 up to 20,000, but 3,000 and 5,000 are exceptions, because 15 and 25 give by multiplication with 200 fluent words, and the sums occur very often in trade: we have therefore 200 × 15 = 3000 and 200 × 25 = 5000; with 20,000 we have reached the highest compound number, 2000 × 10 ẹgbāwa, or commonly called a bag of cowries, *ọkẹ kan* (bag one) because this sum is a load which a man can carry on the head. It is plain the receptacle of the sum provides the name for it; at the same time it is an easy way to express high sums, *e.g.*, one bag = 20,000, 5 = 100,000, 50 bags = a million. We observe that *ẹ̀d* is used for different values 5, 100, and 1000. 5 less 20, 5 less 30, 100 less 600, 800, 1000,

1,200, 1,400, 1,600, 2,000, and 1,000 less 8,000=7,000 &c.; *ed* serves as an arithmetical formula, the value of which must be found from the following factors in the compound numeral, thus, as above: 5 and 20, from 30, 100 from 600, 1,000 from 8,000.

MARCH 9TH, 1886.

JOHN EVANS, Esq., D.C.L., F.R.S., *Vice-President, in the Chair.*

The Minutes of the last meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

From Dr. W. J. HOFFMAN.—A series of Chromolithograph portraits of Natives of Alaska. From water-colour sketches by W. J. HOFFMAN, M.D.

From the CHIEF SIGNAL OFFICER, U.S. ARMY.—[At the request of 1st Lieut. P. Henry Ray.] Report of the International Polar Expedition to Point Barrow, Alaska.

From the UNITED STATES GEOLOGICAL SURVEY. Bulletin, Nos. 7–14.

From the COMPTROLLER OF THE CURRENCY, U.S.A.—Annual Report. 1885.

From the DEUTSCHE GESELLSCHAFT FÜR ANTHROPOLOGIE.—Archiv für Anthropologie. Band XVI, Heft 3.

From the AUTHOR. Perak and the Malays. By Major Fred. McNair.

—— Les Crânes dits déformes. By Juan Ignacio de Armas.

—— Place et importance de la Craniologie Anthropologique. By Dr. L. Manouvrier.

—— Die ältesten Spuren der Cultur in Mitteleuropa, mit besonderer Berücksichtigung Österreichs. By Prof. Dr. Johann N. Woldrich.

—— Das Gräberfeld von Hallstatt. By A. B. Meyer.

From the ACADEMY.—Atti della Reale Accademia dei Lincei. Vol. 11, Fas. 2, 3.

From the ASSOCIATION.—The Journal of the Royal Historical and Archæological Association of Ireland. No. 63, July, 1885.

—— Proceedings of the Geologists' Association. Vol. IX. No. 4.

From the SOCIETY.—Journal of the Society of Arts. Nos. 1736, 1737.

From the EDITOR.—Nature. Nos. 852, 853.

—— Science. Nos. 158, 159.

—— Revue d'Ethnographie. 1885. No. 6.

From the EDITOR.—Matériaux pour l'Histoire de l'Homme. 1886. Feb.
—— L'Homme. 1886. No. 2.
—— Bullettino di Paletnologia Italiana. 1885. Nos. 11, 12.
—— Annalen des K. K. Naturhistorischen Hofmuseums. Wien. Band 1. Nr. 1.

The election of MACCULLOUGH BEY, of Cairo, was announced.

Dr. GARSON exhibited and described some instruments for Anthropometric research, upon which Mr. A. L. LEWIS and Prof. THANE made some remarks.

Dr. JOHN EVANS, F.R.S., exhibited some worked flints from Albania, and a collection of stone implements from India.

Mr. ARTHUR J. EVANS, F.S.A., exhibited some Albanian flints and old English strike-a-lights.

Mr. W. H. PENNING, F.G.S., exhibited some stone implements from South Africa.

The following paper was read by the author:—

On the FLINT-KNAPPER'S ART *in* ALBANIA. By ARTHUR J. EVANS, M.A., F.S.A.

[WITH PLATE I.]

THE Albanian gun-flints and strike-a-lights that I am able to exhibit will be of interest to anthropological students as the most perfect existing representatives of what we may fairly regard as the oldest of European industries. In the course of several journeys through the Illyrian countries between the Danube and Adriatic, I had often been struck with the beautifully worked flints exposed for sale in the bazaars, and whether I noticed them in Bosnia, in Servia, or Bulgaria, I was always informed that the place of their manufacture was in Southern Albania.

During a recent journey through Epirus, I was so fortunate as to observe in a street of Joannina an old Albanian flint-knapper practising his truly elegant art. Squatting in Turkish fashion on the pavement, he took a roughly broken flint out of a small sack by his side, and having, with a small, stumpy, flat-ended hammer, knocked off a fragment suitable to his purpose, he proceeded, with a hammer of more attenuated form, to flake the fragment into shape. The hammer used for this purpose—a specimen of which I am also able to submit to this Institute—was a small elongated section of a square, rudely beaten, iron bar about $2\frac{1}{3}$ in. long by $\frac{1}{3}$ in. broad, fitted by means of a hole

in the middle to what seemed a very slender handle. Using this instrument with really marvellous dexterity, he now chipped out the flake that was to form the nucleus of the future gun-flint or strike-a-light into the requisite shape—a square or oblong with slightly incurved sides. The requisite shape was given by short, swift side-strokes of the hammer, and it is to be observed that for this finishing process the blows were given, not with the small flat end of the hammer, but with the sharp side angles. The minute precision of the stroke must require long practice, and the skill of the Albanian workmen will be best judged by the specimens exhibited, which are by no means exceptional in their finish.

I persuaded the old flint-knapper, whose name was Békir and who was a Mahometan Albanian from Tepelen to accompany me to the place whence he obtained his flints. This was a range called Gramenohoria, about two hours distant from Joannina, not far from the village of Dobro. The flints were mostly of tabular shape, scattered in profusion about the summit of a limestone plateau, but though I searched diligently, I was unable to discover any signs of their having been used for manufacture in ancient times. So far as I am aware, no flint implements of prehistoric date have been found either in Epirus or Albania, though several polished stone axes of diorite and, I believe, other materials have come to light. This deficiency is the more surprising when it is compared with the abundance of finely worked arrow heads and lance heads on the opposite Italian coasts—the ancient Iapygia, Messapia, and Apulia—which were largely peopled, as we know from philological evidence, by immigrant tribes from the Illyrian and Epirote mainland in prehistoric times. Speaking generally, I may say that the few Neolithic remains with which I am acquainted from the western part of the Balkan peninsula, including Dalmatia, fit on to those of prehistoric Greece, including parts of Asia Minor, and are characterised by the absence of implements of flint. The celts discovered in this old Illyrian region are generally stumpy, of nephrite and other materials, and only in Northern Dalmatia, *e.g.*, in a cave near the source of the Cettina, about Nona, the ancient Ænona, and in the Isle of Osero in the Quarnera, have flint flakes been hitherto found. It is possible, however, that a careful examination of the flint producing districts of Albania may result in the discovery of some site of ancient manufacture. At present the chief site of flint-knapping industry is Valona and its neighbourhood, notably the village of Drashovitza, where, according to an informant of Von Hahn,[1] the flint lies in layers at some depth

[1] Albanische Studien, p. 72.

beneath the surface and has to be procured by digging. Certainly it would be difficult to find a more appropriate site for the manufacture of the ancient *ceraunia* than upon the flint-producing soil of the Acroceraunian Mountains.

It will be seen that the strike-a-lights, as exposed for sale are partially cased in ornamental lead sheaths, studded with glass gems, and otherwise adorned with something not unlike the ancient "honeysuckle" pattern. These æsthetic adjuncts, as well as the highly-finished implements themselves, are very characteristic of the Albanian race, which stands alone amongst the Balkan peoples, and, it may be added, the primitive population of Europe generally, in its love of ornament and display; the trade in gun-flints has indeed continued to flourish mainly owing to the affection of the Albanian highland clans for the old silver-mounted flint-locks. Trade, however, has become depressed since the brigands of Pindus have taken to the Martini.

Comparing the Albanian flints with those produced by our Brandon flint-knappers, and with Old English, French, and German forms, it will be seen that they show the peculiarity of being uniformly chipped on both faces, instead of presenting one flat side. They are not, like the English examples, so much the result of two or three bold strokes, but are fashioned with a minute care that recalls the "beautifully even surface chipping" of neolithic times, justly described by Mr. Skertchley[1] as, in Britain, a lost art.

Explanation of Plate I.

Fig. 1. Iron hammer-head used in Albania for dressing flints.
Figs. 2, 3, 4, 5. Gun flints and strike-a-lights, with and without leaden sheaths. The characteristic ornamentation is shown in figs. 4 and 5.
Fig. 6. Iron used for striking a light.

All the figures in this plate are of natural size.

Discussion.

The Chairman pointed out the difference between the gun-flints of Albania and those made in this country. In making our flints a broad flake is first struck off, and this flake is then broken into three pieces. Each piece is formed into a gun-flint by having its edges dressed on an anvil. But in the Albanian method the two faces of the flint are delicately chipped by a series of blows producing surface-flaking, somewhat like that seen on some of the ancient implements found in Denmark. The speaker described the

[1] "Manufacture of Gun Flints," p. 41.

specimens that were exhibited to the meeting, and referred to the notches seen on some of the old mounted flints of Albania as evidence that they were used as strike-a-lights. The want of regularity in the outline of certain flints is probably due to their having been employed for this purpose.

Prof. RUPERT JONES congratulated the Institute on having received an explicit account of the manufacture of elaborately chipped flint implements by a native maker of gun flints and strike-a-lights, from one who watched and understood the process, and who took the trouble not only to secure tools and specimens, but to see where the flint was obtained in the district. The style of workmanship was interesting as bearing on the preparation of some French and other highly-chipped flint implements from prehistoric localities.

The Secretary read the following notes:—

NOTES *upon a few* STONE IMPLEMENTS *found in* SOUTH AFRICA.

By W. HENRY PENNING, F.G.S., &c.

[Abridged.]

THERE is a striking general resemblance between many of these implements and those of palæolithic age found in Europe. The stone axe found near Pretoria especially, might, from its appearance, have been taken from the valley-deposits of Hoxne or of Abbeville. But at the same time there are essential differences in the mode of occurrence. The palæolithic implements of Europe are embedded in ancient river-beds, while those of South Africa are found on the surface, as are the neolithic elsewhere. It might be assumed, therefore, that the African examples of palæolithic type are more recent than the European, and consequently, that the tribes by whom they were made spread southwards from Europe.

But this, although probable, is not certain because South Africa has been continental for a very long period (the interior probably since the close of the oolitic epoch) and was carved into its present form long before the quaternary gravels of Europe were in process of accumulation. The rivers, in proportion to area, are few and insignificant, and during the more recent periods there has been comparatively little denudation. The resemblance, therefore, testifies only to a contact between the races somewhere and at some time, but the disparity in mode of occurrence affords no clue to age—that is, to the direction of their migration.

The implements exhibit extreme weathering, some indeed, look water-worn, but they can never have been subject to such

action. They are very numerous, also, in some localities. The materials mostly used were quartzite, indurated shale, and trap-rock; and for the smaller weapons, hornstone, ribbon-jasper, and chalcedony.

DISCUSSION.

The CHAIRMAN reminded the meeting that the subject of South African stone implements had on several occasions been discussed by the Institute. The implements found on the surface belong to widely-separated periods, for while some are certainly not of remote antiquity, others may probably be referred to the palæolithic period. Although the implements are commonly obtained from the surface, yet there is more than one well-attested instance of their having been discovered at considerable depths. Even if found on the surface this fact would not necessarily militate against a high antiquity in a country where sub-aerial denudation is not energetic. The speaker compared some of the South African implements with those found in East Anglia, and called attention to the similarity between certain quartzite implements from Africa and those found in the laterite of India.

Prof. RUPERT JONES remarked that Mr. Penning's paper was rich with facts and inferences of great value. They would be still more valuable if described with reference to some communications already published by the Institute, so as to bring them under some recognisable classification as to the forms of implements, and the p'aces and modes of deposition. The source of the quartzite from which many of the implements have been made should be defined if possible. He also thought that the different styles of workmanship did not necessarily imply the same relative antiquity for such implements in different countries. The author, in his account of the superficial denudation and its results had not regarded, it seemed, the great glaciation which South Africa had suffered in post tertiary times.

Mr. BERTIN asked if care had been taken to ascertain the real date of the stone implements, as the bushmen of the present day still use stone implements in preference to others. If they use metal it is as they found it, a nail, a piece of iron, &c. It is true that for many centuries the bushmen have been using the same kind of weapons, but ancient weapons would be exactly as the modern ones, and could not prove anything.

Mr. A. L. LEWIS, remarked that the material of the axes exhibited and the manner in which they occurred seemed to him to resemble those found on the surface in the Côtes du Nord, France, and considered—he hardly knew on what grounds—to be palæolithic rather than those of Abbeville; but, even if the resemblance between the South African and the French implements were greater than it really is, he thought they would all agree with Professor Rupert Jones in considering that the resemblance was no proof of any connection between the makers of the implements in the two countries. Major Feilden, who had exhibited to the Institute a

very large collection of implements of different types and different materials from South Africa, was, he believed, quite opposed to the idea of their being of anything like European palæolithic antiquity. The effect of the rains in South Africa upon the surface of the country was, he understood, very great, and might account for water rolling and depositing at considerable depths.

Mrs. Carey-Hobson said that upon one of the Karroo flats, near a permanent spring, she had come upon a factory of implements; they were there in all stages of manufacture, most of them small for hunting purposes, and the stone used was almost black, indeed some that she had found in a more distant part of the plain, evidently polished by use, were perfectly so. The rock she believed, was basaltic: there were two or three blocks at this place which must have been brought from the mountain range thirty or forty miles distant. Stone implements were also constantly turned up by the plough on the Karroo farms, many of them being of a close-grained stone of a light fawn or drab colour. She had never found any *flint* implements. The flints used so much with the tinder boxes were all imported.

Mr. Penning has since sent the following note in reply to Prof. Rupert Jones's enquiry:—

The Pretoria implements are made from quartzite beds of the Megaliesberg Mountains; the Orighstad implements from quartzite of the surrounding hills. In the Vaal River there is chalcedony, and trap-rock occurs in nearly all localities in abundance.

The Secretary read extracts from several letters addressed by Mr. Bruce Foote to Dr. John Evans, relative to recent discoveries in India of which the following is the substance:—

Notes *on* Prehistoric Finds *in* India.

By R. Bruce Foote, Esq., F.G.S., Geological Survey of India.

In the beginning of 1881 Mr. Foote broke fresh ground geologically near Cape Comorin. The people in that region consume an immense quantity of shell-fish collected on the coast and carried many miles inland, but nowhere could the writer find any accumulations comparable with the European kitchen-middens, though he looked out for such deposits all round the coast. The only object of archæological interest discovered was a small bone pendant washed out of the black mud of a submerged forest at Valiumkkam, on the south coast of the Madura district, about 25 miles west of Pamben Strait. The object has a hole drilled in it, and is ornamented with simple incised lines.

A few days previously to this discovery the author had made an interesting find of cores of the Jubbulpore type, at a place about fourteen miles south-west of Tutikorim. Here a hill of blown sand had been denuded by the wind on its south-west side to a depth of fifteen or sixteen feet below the present adjoining level. The cores, with a number of flakes and some fragments of red pottery, lay on the surface of a bed of dark red loam under the moving part of the sand. All the cores and most of the flakes are of reddish brown chert—a stone foreign to that part of the Tinnevelly district. The other flakes consist of translucent quartz, quite unlike any quartz which the writer had found in that locality. The quartz is stained red from the oxide of iron which abounds in the deep red blown sand that had covered the flakes. The pottery is of fair quality, rounded at the edges by the action of the sand-blast, and the largest fragment shows traces of an indented pattern made by impressing the end of a narrow wedge-ended stick.

The writer's next find was made in 1883, near the celebrated diamond mines of Banaganpalli, in the Kurnool district. Here he came upon either a village-site or a place where burial had taken place, at which a considerable quantity of pottery of the characteristic red and black glazed type had been buried, together with a few good cores of the Jubbulpore type, some iron implements, much rusted, and some pounding stones. There were also found a large stone pestle and a slyking stone, both well polished. The writer likewise found a good spindle-wheel in pottery; a bead of white shell; the right valve of an *unio*, of which the lower edge had been ground away; and a few comminuted bones, some of which may be human. The field to the east of the pottery site yielded a good number of cores, scrapers, and flakes, and a large quartz of jasper, chert, agate, Lydian stone, &c., all foreign to the locality, and apparently, brought together to be fashioned into flakes and scrapers.

The pottery was buried at a very small depth, and had consequently been greatly broken by the trampling of cattle pasturing over the spot. Many of the vessels, however, can be largely restored by piecing the fragments together. Vessels of nearly a dozen different forms were found and of these, two are not represented among the antique pottery in the Madras museum, derived from various old tombs and cromlechs in the south. Of these forms, one is a deep drinking vessel with pointed oval base, evidently meant to be held in the hand or rested on a pottery ring. Several of the latter, but of a larger size, were found.

The other form was like a flowerpot with a small base and very large mouth. Among the iron implements are three

unquestionable arrow heads, barbed on one side only, and an implement like a very thin palstave, with one sharp-edged rounded end. The occurrence of these iron implements and pottery, with the chert, agate, and jasper cores is very interesting, and as far as the writer knows, gives the first clue to the real age of the cores. He got about 120 cores, many of them capitally made. The agates used are from the Deccan amygdaloidal traps, and must have been brought from the bed of the Kistna, a distance of over forty miles.

Early in 1884, while hunting for coal, to the east of Hyderabad in the Deccan, Mr. Foote came across traces here and there of neolithic work, in the form of broken implements (celts). At two places he found old village sites clearly indicated by great quantities of broken pottery of the glazed red and black type. Unluckily he had not time to explore them. At the second place, some twelve miles west of Khummummett, he got a broken stone cylinder of polished sandstone, a sort of rolling pin. On a hill of granitic gneiss, some thirty miles east of Hyderabad the writer found at least a dozen highly polished grooves, eight to ten inches long, worn into the rock probably in giving an edge to celts. A few miles off he found the ground thickly strewn with old flakes, amongst which was the first half of a good sized rough celt, similar to some he had found near Bellary with polished celts, about which he wrote a letter to the *Geological Magazine* which was published in the February number for 1873. These celts he exhibited at the Vienna Exhibition, and finally presented to the Calcutta Museum.

In December, 1885, Mr. Foote revisited Bellary, and looked up the localities where he had found the celts, both chipped and polished. He got several more in the north hill at Bellary, and a few days after found a large settlement of the celt-makers on the north side of the Peacock Hills, the south side of which he visited in 1872, with Mr. Frazer, C.E., the original discoverer of the Bellary celts.

Mr. Foote's reasons for regarding many of the localities at which he got numerous celts and other implements as old settlements or village sites of the celt-makers are the following: Wherever the celts and other implements were found in large numbers, the hills on which they were found showed many signs of human habitation. Many small terraces had been raised among the great blocks of granitic gneiss of which all the hills but one consist.

Many of the terraces were evidently constructed with reference to the convenient proximity of rock shelters, and in most cases they lie on the eastern flanks of the hills where they obtained early shelter from the blazing afternoon sun. On the terraces

and flats are large quantities of flakes produced by the manufacture of the implements, and implements in all states of completion, from the roughest to the highly polished. As the great majority of the celts and most of the other implements are made of dark greenstone or other hornblendic rock, these flakes and implements present a strong contrast in colour to the pinkish and greyish granitoid masses forming the hills.

The made ground on the terraces and under the rock shelters is largely made up of broken pottery (all of antique type where the shapes are recognizable) mixed up with much ash, more charcoal, and occasional bones and teeth (mostly bovine).

Where the celt manufacture was most energetic many surrounding convenient flattish rocks show shallow pan-shaped hollows, evidently worn by the grinding of the implements. Many of these are in groups of fours and fives, indicating that the polishers were sociable, and squatted together while at work. In one place about twenty in a space not fifteen yards square. The well preserved and little weathered celts seem to have been covered up to a great extent, and probably for long ages, and only lately exposed by the action of heavy rains. Most of the polishing places were on solid rock, but a few were on large or medium-sized blocks, the latter generally broken.

The edging hollows such as were described on the hill east of Hyderabad are not common in the Bellary country, but Mr. Foote noticed some capital examples close to a flat broad pan on the north hill at Bellary. He procured celts, &c., from twenty-five different places of which twenty-two are on hills. In every case but one the greenstone of which the implements were made had been brought from a distance, and often for many miles. In the one case where the greenstone had been taken from a large dyke cutting through the middle of the settlement the manufacture had been carried on on the largest scale, and the writer procured very large numbers of rough implements. Many, though quite rough, are of capital shape, even when of very large size, and if finished would have made noble celts.

The chippers evidently had an eye to saving themselves labour, and collected suitable fragments from the surfaces of dykes yielding fit stone. In several cases they had brought rough fragments of distinctly "celty" shape from distant dykes on to their granitic gneiss fastnesses and had not put them to use.

All the hills on which the principal settlements occur were places of great strength and well defensible against great odds. All rise abruptly from two to six hundred feet out of the nearly dead level plains now covered by the bare cotton soil plains for which the Bellary country is notorious.

Mr. Justin Boyd, Manager of the Madras Bank (branch) at Bellary, is carefully exploring the two settlements at Bellary, and it is hoped will get much out of the pottery and ash heaps. He has half a large perforated hammer stone of the type figured on page 204 of Mr. Evans's "Ancient Stone Implements."

The group of settlements of the celt-makers lies within the limits of the old Bellary district, lately divided into two, Bellary and Anantapur. The greater number of the settlements lie within a triangle of which the Madras Railway between Bellary and Gooty (Gutti) is the hypotenuse and Uderpy Droog the apex of the opposite angle. A smaller group of settlements lies to the west of Bellary, but is not of any less interest.

In the western group several settlements show a special feature not noticed in the easterly ones, namely, large accumulations of a light yellow scoriaceous slag. The most remarkable of these slaggy heaps, some fifteen miles west of Bellary, has been described as a volcanic cinder cone, but when Mr. Foote visited it in 1872, he found a celt and some rubbing (mealing) stones and pounders in the midden-stuff between layers of the slag.

His second visit, early in 1885 quite confirmed his ideas that this must be a settlement, for he found several more pounding stones washed out by the rains which have scored the mound pretty deeply. This is the mound he referred to in a letter printed in the *Geological Magazine* for April, 1873. Mr. Foote found smaller heaps of similar slag at three other localities still further west of Bellary. In these cases the origin of the slag heaps was even more distinct, for among the slag and under it were large numbers of mealing and pounding stones, broken pottery, and a fair number of celts in various states of completion, and withal a considerable number of bones of oxen. A large slag mound of similar character near the ruins of Vijnyanager, still further west, is the subject of an old legend which states it to be the result of the cremation of a wicked giant "Bali," killed by Rama on his way to Ceylon.

The southern celt-makers were probably not one whit inferior to those of central India, any more than are the living Dravidians behind their northern neighbours. As far as Mr. Foote's observation goes the southern folks are in every way equal to the more be-praised Bengali and Hindu tribes.

Discussion.

The Chairman described certain Indian stone implements which were exhibited to the meeting. Some of these, of palæolithic type, wrought in reddish quartzite, were obtained by Mr. Foote in the laterite deposits of Madras. Three polished celts from Central India

were compared with similar implements from Ireland. Attention was called to some well-shaped jasper cores, from which flakes had been struck; one of the cores being so perfectly symmetrical as to have been mistaken for a fossil fruit. A characteristic type of stone adze from Burmah, presenting a tang and a square shoulder, with a long bevelled edge was exhibited and described. Its shape is somewhat like that of an ordinary plane iron.

Professor RUPERT JONES alluded to the probably great antiquity of the quartzite implements first found in the laterite, as they were regarded as having been deposited on the shallow sea-bed of the coast, subsequently raised up as land. He did not clearly understand what relationship as to probable age and mode of deposit those now described had to the others. He enquired how far the quartzite tools found in Devonshire resembled those of India and South Africa.

MARCH 23RD, 1886.

HYDE CLARKE, Esq., *Vice-President, in the Chair*, which was afterwards taken by C. H. E. CARMICHAEL, Esq., M.A.

The Minutes of the last meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

From the GOVERNMENT OF MADRAS.—Administration Report of the Government Central Museum for the year 1884-85.

From Dr. W. J. HOFFMAN.—Notes on certain Maya and Mexican Manuscripts. By Cyrus Thomas.

From the AUTHOR.—Flint Implements from the North-east of Ireland. By W. J. Knowles.

——Effigy Mounds in Iowa. By T. H. Lewis.

——On Jadeite Ornaments from Central America. By F. W. Putnam.

——Ethnographische Karten von Richard Andree.

From the VEREIN FÜR ERDKUNDE ZU LEIPZIG. Die Seen der Deutschen Alpen. By Dr. Alois Geistbeck. Mittheilungen, 1884.

From the K.K. AKADEMIE DER WISSENSCHAFTEN, WIEN. Sitzungsberichte, Philosophisch-Historische Classe. Band cvii, Heft 1, 2; Band cviii, Heft 1, 2, 3; Band cix, Heft 1, 2: Mathematische-Naturwissenschaftliche Classe. I. Abthlg. 1884, No. 6, 7-10; 1885, No. 1-4; II. Abthlg. 1884, No. 6–10; 1885, No. 1-3; III. Abthlg. 1884, No. 3, 4, 10; 1885, No. 1, 2. Register XI. Almanach, 1885.

From the ACADEMY.—Atti della Reale Accademia dei Lincei. Serie Quarta. Vol. II. Fas. 4.
——Bulletin de l'Academie Impériale des Sciences de St. Pétersbourg. Tom. XXX. No. 3.
From the INSTITUTE—Proceedings of the Canadian Institute. Third series. Vol. III. Fas. 3. No. 144.
From the INSTITUTION.—Journal of the Royal Institution of Cornwall. Vol. VIII. Part 4.
From the SOCIETY.—Journal of the Society of Arts. Nos. 1738, 1739.
——Proceedings of Society of the Antiquaries. Second Series. Vol. X. No. 3.
From the EDITOR.—Nature. Nos. 854, 855.
——Science. No. 160.
——L'Homme. 1886, No. 3.

The following paper was read by the author:—

The PRESENT CONDITION *of the* NATIVE TRIBES *in* BECHUANALAND.

By C. R. CONDER, Captain R.E.

THE subject on which I have been invited by the president to read a paper before you is that of the present condition of the native tribes in Bechuanaland. During the recent expedition under Sir Charles Warren, my duties, as Boundary Commissioner and otherwise, led me to study, to the best of my ability, the character and condition, especially of the Batlaping and Barolong divisions of the Bechuana Kafirs; and in addition to the result of personal enquiry, I obtained a good deal of information from such residents as have longest dwelt among these tribes, especially from the Rev. W. Ashton, a friend of Dr. Livingstone, who has lived in Bechuanaland since 1843, and from the Rev. J. Mackenzie, who dwelt for many years at Shoshong, the chief place of the great Bamangwato chief, Kama. Very valuable information has also become lately available, in the voluminous Blue-Book on Native Laws and Customs, published by the Government of Cape Colony. From such sources I collected information, which I will endeavour to put in such a form as to afford an answer—so far as I am able to render one—to the majority of the questions contained in the valuable "Anthropological Notes and Queries," prepared by the Committee of the British Association.

Before proceeding, however, to the main question, a few words may be said concerning the surrounding tribes; and as to the present proportions of the various divisions of the Bechuana.

The new Crown colony of Bechuanaland, of which I laid down the eastern boundary, is situated west of the Transvaal, and north of Griqualand West. It includes the territory of the Batlaping and Barolong tribes of the Bechuana, and that of the Batlaros, lying further west, near the border of the Kalahari Desert. North of the colony, a large country, inhabited by the Bangwaketse, the Bakwena, the Bakatla, and the Bamangwato, stretches towards the Zambesi. The remnants of the Makalaka (akin to the Basuto) intervene between the northern Bechuana, and the Matabele (a Zulu race), who occupy a rich country, north of the Transvaal. North-east of the Matabele is Mashonaland, a country rich in minerals, extending to the Zambesi. Bechuanaland itself is a pastoral country, consisting of a great plateau, 4,000 feet above the sea, with a fine climate, and grazing lands, said in some cases to be among the finest known in South Africa. Within the limits of the Crown colony there is but little bush, and the country is certainly very superior in fertility to the colonial possessions south of the new colony. The principal drawback is the insufficiency of water; but the rainfall is in many years plentiful, and a small expenditure in public works would greatly improve the country in this respect. The streams during the summer rains become impassable rivers, but the water soon rushes off to the Vaal River, or is lost in the Kalahari Desert.

It is extremely difficult to obtain reliable statistics, as to the numbers of the native population in Bechuanaland. War has not materially affected the question, and the large native families, under a polygamous system, tend to give a rapid increase in numbers. On the other hand, recent famines, and increasing disease, tend to reduce these numbers; while the inroads of white men lead to migrations, which result in decrease of native numbers in the south and east, and corresponding increase in the north and west. It was part of my duty to collect such statistics as were available, but the results were very rough. The fighting men of the Batlaping may, I think, be stated at some 3,000 in all. The Barolong within the colony have, perhaps, 2,000 fighting men; those within the Transvaal were more numerous, but are now dispersing in all directions. Of the northern tribes, the Bamangwato is the largest, and Kama, their chief is said to have 500 mounted men armed with rifles. In addition to the Bantu races, just enumerated, there were till quite lately some 5,000 Korannas, inhabiting the neighbourhood of Mamusa, now within the Transvaal. This settlement has been attacked by the Boers since the return of the expedition. The chief (David Massouw) and 100 men of the Korannas are said to have been killed, and many virtual slaves (or apprentices as they are called) have been made. The settle-

ment seems, in fact, to have been broken up and the land reserved to the natives to have been confiscated.

A rough table of the population would give the following results:—

Within the Crown colony of Bechuanaland	Batlaping about	18,000 souls.	
	Barolong „	15,000 „	
			33,000
North of the Crown colony.	Bangwaketse ..	20,000 „	
	Bakwena ..	30,000 „	
	Bamangwato ..	40,000 „	
	Smaller tribes	60,000 „	
			150,000
			183,000

I see reason, however, to suppose that these proportions will further be modified by the disappearance of numbers of the Batlaping,[1] in consequence, partly of migration, partly of starvation, from which this unfortunate tribe was suffering when last I visited them at Taung.

As regards the Korannas, they are a Hottentot people, and I only came in contact with them in their locations in Barkly West and at Christiana, in the Transvaal. I was very much struck with the strongly Turanian type of the race. The broad cheek bones, the small eyes, wide apart and slightly oblique, the small mouth (somewhat projecting) and short nose, and even the colour, which is much lighter than that of the Kafirs, called to my mind both the Japanese and also the Turkish peasantry of Asia Minor.

I have heard it stated that the practice of excision, which occurs among the Copts and, I believe, among the Abyssinians, is also existent among the Korannas, as well as circumcision.

Both sexes color their hair with black lead, their faces with red lead, even when wearing European clothing. They consider that this renders them more beautiful, like the Zulus who paint themselves white for the same reason.

As regards the Matabele my duties did not permit of my visiting their country. A mission under Lieut. Haynes, R.E., was sent to the capital Gobilawayo to visit the Matabele king, Lobengula, with a letter from Sir C. Warren. This officer would, I think, be able—judging from my conversations with him—to give valuable information as to this warlike and important tribe.

The Matabele were originally Zulus, who, being unsuccessful in war, under Mosilikatse, were afraid to reappear before the

[1] Sir G. Campbell called attention in discussion to the sparsity of the population, a fact which, of course, ought to render it all the easier to find lands for both natives and white men.

terrible Chaka. They settled in the Transvaal and were driven thence to their present country by the Boers. Their name in Sechuana means "naked" and is due, not to the fact that they are lightly clad, but because they offend Bechuana ideas of decency, not wearing the small fur apron which men and boys always wear among the Bechuana, even when they have no clothes. The Matabele on the contrary wear a wooden box like that of the Zulus. The numbers of the Matabele have been recruited by the education of slaves from among the Makololo, Makalaka and even Bamangwato. The old Zulu type is rapidly dying out through this infusion of Basuto and Bechuana blood. and the warlike prowess of the Matabele is also decaying, so that a regiment defeated near Lake N'gami was not ashamed only last year to return to the King. It is probable that the great chief Kama is strong enough, if supported, and protected from Boer encroachments, to keep the Matabele at home. The latter are moreover well affected to the English.

I now turn to a description of the Batlaping and Barolong, basing my observations on the British Association Queries so far as I am able to deal with them. I was, however, unable to take any measurements of natives or any exact notes concerning colour, anatomy, or physiology. There is great variety in the shades of colour, but it seems that those of the purest blood are the darkest, judging from the chiefs. It is said also that the colour of the northern tribes is deeper than that of the southern, and the eyes larger. As regards odour I can attest that this increases in consequence of violent exertion.

The language of the Bechuana tribes is well known as a branch of the Bantu group. There are no clicks in Sechuana, but the Batlaping on the south are said to have contracted the habit of introducing clicks in some words in consequence of Hottentot influence. The sound represented by Tl as in Tlapi, "a fish" (whence Batlaping or "fish people") approaches a click. The name as will appear later may be connected with a former worship of the fish. The greatest peculiarity which I noticed was, however, the intonation of the language, which is only caught after long residence, and which contrasts strongly with the energetic enunciation of Orientals. Sechuana is a very melodious and liquid language, and the speech of the natives is full of poetic imagery, which is admired so much as to form a distinct feature in their public speaking.

Their confusion of the letters D, L, and R, is also remarkable. They can distinguish B and P which to an Arab sound the same, but which the Turks distinguish. The Sechuana P, indeed, is highly emphatic, resembling that of the Irish as in their pronunciation for instance of the word "ppig"; but the Sechuana word for

God may be written Modimo, Morimo, or Molimo, and the blue wildebeest (or gnu) is called Phudomo, Pulomo, or Puromo either sound being recognised by a native. It must be remembered that even the early Greeks did not always distinguish L from R, and the hieroglyphic sign is the same in Egyptian for these two letters. In the east however, D is confused with T rather than as among the Bechuana with L or R.

The Sechuana language, I am told, does not possess any true numerals above *six*. Seven is "shupa," meaning "look out," and being the name of the forefinger. The word for eight means "two fingers down," nine is "one finger down." Ten is "completion," eleven "completion one finger up." When therefore we come to twenty eight we get the clumsy form "two completions two fingers down."

The traditions and customs of the Bechuana point to their migration from the north-east. The old tribe of the Bahrutsi is still, I believe, not extinct, and an offering of first fruits by Bechuana chiefs to the chief of this tribe seems to show that they are acknowledged as the parent stock. The Barolong have inhabited their country from time immemorial. The stone krantzes which they erected as fortifications against the Zulus under Chaka, I have found all along the present border of the new colony. One division of the tribe migrated into the Orange Free State and returned thence within the memory of middle-aged men; first inhabiting Taung, which now belongs to the Batlaping, who originally lived further west; and afterwards under Moshette, settling at Kunana, a very large native town now placed in the Transvaal. This town is again being deserted by the Barolong.

There seems reason to suppose that the physique of the Bechuana tribes in the south is steadily deteriorating. This is due clearly to the influence of the whites—to the breaking up of the old social system, the laws and customs of which were well adapted to native life; and to the introduction of bad brandy and syphilis. It is thought that the adoption of European clothing has affected the health of the people, but there are clear indications that the asthma, consumption and lung diseases from which the natives suffer are congenital, and, I think, they should rather be ascribed to the excesses of the parents on whom the white men have had a disastrous influence. We have been told lately that the natives are only allowed to buy "ginger pop." If this is the case, I can only say that ginger beer in South Africa produces symptoms indistinguishable from those due to the consumption of brandy; and I have seen brandy drunk by natives in quantities which white men could not consume.

As regards the morality of the people, their indifference to the conduct of the women is very astonishing to any traveller accustomed to Orientals. Some missionaries admit that the morality of mission stations is inferior to that of the old Pagan days. There is a simple explanation of this, as shown by the Blue-Book above noticed. Some missionaries discountenance the old native custom of giving a certain number of cows to the father of a bride, which they regard as equivalent to buying the wife, though this is not the native view. The consequence is that the native girls have no longer a market value, and the control exerted over them by their parents, and especially by the mothers, is relaxed. The morality of the natives after marriage is, on the other hand, probably improved by the influence of the very able and energetic men who accompanied and succeeded Dr. Moffat. The natives are said to be affectionate and fond of their children, and they certainly possess a love of justice and fair play and ideas of right and law which should commend them to Englishmen. Unfortunately, the colonial population have not upheld British reputation in this respect, and the natives draw a sharp distinction between the British—chiefly known to them as soldiers or missionaries, and the colonials—traders and speculators. The prohibition of the sale of spirits is strictly enforced by such chiefs as Montsiwa and Kama who have learned that the introduction of brandy means the destruction of the tribe. This wise prohibition is clearly due to missionary influence.

Under the head of psychology I may note that the Bechuana appear to be an intelligent people. They easily learn when taught, to read, write, and cypher; they are even able to draw maps (I possess a sketch of country by one of the Barolong) and Sechele, chief of the Bakwena, sent his sons to Cape Town to school, and introduced convict labour in his country in imitation of Cape laws. They are, however, slow in their mental operations, as in their movements, and ponder long before answering, thus forcibly contrasting with Oriental volubility. That they are courageous has often been proved; they are, however, neither honest nor truthful as a rule, and small thefts are common. They are fond of giving long and rambling dissertations on trivial subjects and their deliberations in council are endless.

As regards astronomy, they appear to conceive of a firmament like that of the Babylonians, and they say that the sun travels under the earth at night. Some old people still alive have, I am told, heard the noise which the sun makes during this nocturnal journey. They have, it appears, a native calculation of the year, though I am unable to say whether this is lunar or

solar. They have ceremonies connected with the new moon, and on moonlight nights they sit in the kotlas or village yards singing and dancing and drinking Kaffir beer. They also have harvest festivals with dances.

The ordinary native food is a sort of porridge, made of mealies or of Kaffir corn. They do not appear to make bread. They are great flesh eaters, and in addition to game will, when hungry, eat almost any kind of dead animal. I have seen them eating a mule which died of pneumonia. The Kaffir corn makes a sort of stupefying beer, but can only be indulged in by chiefs, except at the great feasts. The natives often ask for tobacco, and smoke short European pipes. They are also said to smoke a kind of hemp. I believe none of the Bechuana tribes eat fish even when living near rivers.

Mr. Ashton gave me information as to the eating of locusts by the Batlaping. The natives go by night with great bags to catch the sleeping locusts. They boil them in large iron pots, then lay them out to dry. When dried, the locusts are winnowed, the wings, legs, and head being blown away like chaff. The bodies can be kept for a considerable time. The eating of locusts is said to give a peculiar smell to those who devour them in quantities, but the natives are so fond of this food that a visitation by locusts, which ruins the white man, is rather welcomed by the Bechuana.

The frequent droughts in Bechuanaland often reduce the smaller tribes to living on berries of the Moretlwa (*Grewia flava*) and Mohatla (*Tarchonanthus*). The Makalahari (or "poor men") and the bushmen who are slaves of the Bechuana in the towns live on game and on roots. Their tribute consists of skins, and of certain parts of animals killed.

A number of the Barolong and the Bakwena and Bamangwato now profess some kind of Christianity. I think that it is certain that in some cases—as, for instance, the great and honest Kama—this profession is sincere. The Batlaping at Taung are pagans, and Montsiwa, chief of the Barolong of Mafeking (or more correctly, Mahiking), remains a pagan, though tolerating Christianity among his people.

Previous to the introduction of Christianity, the Bechuana appear to have had only very vague religious ideas, and their attention was chiefly occupied by the detection of wizards and witches. The word Morimo for God (also used in the plural to signify the Manes of the dead) appears to have meant a great and angry personage living in "the great hole in the North." Morimo sends the lightning—which in Bechuanaland is continuous for hours in summer, the storms being very violent, and the lightning unusually magnificent

and destructive. The Hottentot Heitzi Eibib, who lives in a great hole, seems akin to Morimo. The Sechuana word for soul is Moia, meaning "breath," but they do not seem to have any expectation of future immortality. The ghosts of the dead are, however, believed to haunt the living, and to watch over their descendants. No idols or fetishes appear to exist among Bechuana tribes, and indeed Dr. Livingstone has remarked on this difference between the Bantu tribes and the negroes whom he encountered further north. As regards festivals, the harvest feast, as I saw it at Kunana among the Barolong, was celebrated with dances, songs, and drinking of Kaffir beer or brandy. The men assembled in a circle blowing on reed pipes and jumping round in a slow ungainly fashion. The women marched round outside, clapping their hands.

The initiatory rites of boguera (for boys) and boyali (for girls), will be well known to this Society. They are still practised among the northern tribes at least. Both girls and boys are organised in regiments, each regiment consisting of those within a few years of the same age. The boys of a regiment are circumcised when the chief's son, who commands them, is about 13 years of age. The beating of these boguera candidates with rods of Moretlwa (*Grewia flava*) was observed at Molepolole, capital of the Bakwena, by officers of the recent expedition.

Ordeals are noticed by Dr. Livingstone, namely, the Muavi, or drinking of *goho* juice by women, but on this point I gathered nothing new. As regards wedding ceremonies, there is one of casting an arrow into the hut by the bridegroom, which is worthy of notice as symbolic.

Among superstitions I may mention that of the "evil foot," which seems to correspond to the evil eye. After a birth no man is allowed for some days to enter the hut, and an infant is said to have died from the "evil foot" of a man so entering. It appears that tree worship exists among the pagan Bechuana. Mr. Mackenzie notices the habit of praying before the largest tree in a thick bush. A native entering a village on business will place a stone in the branch of a tree near the road, in order to obtain success in his affairs. I have seen these stones in trees. The custom is no doubt akin to that of Arabs and other Orientals of making cairns under trees, each visitor or passer-by adding a stone to the cairn.

The idea of the Totem may also, perhaps, be traced among these tribes. Many tribe names are derived from those of animals, as Batlaping from Tlapi "a fish," Batuana from Tao "a lion," Bakatla from Katla "a monkey," Bakwena from Kwena a "crocodile" The tribe is said to *bina* or dance before its sacred animal, and at the great council held by the Bakwena to meet

Sir C. Warren the assembly shouted Makwen or "O crocodile man" at each point of the chief's speech. The crest of Sechele, chief of this tribe, is, I am told, a blue crocodile carved in stone. Mr. Mackenzie mentions that certain bushmen *bina* the common goat. It is unlucky for them to gaze on one, and renders them impure. The Bakwena also may not look at a crocodile and Livingstone tells us that they may not look at a zebra or quagga (Pitsi). A man bitten by a crocodile is exiled, yet the Bakwena will eat the flesh of the zebra.

The Puti or duiker, a kind of antelope (*Cephalopus mergens*) is sacred to the Bamangwato, whose chief, Kama, is named from another species, the hartebeest (*Bubalus caama*); and the hippopotamus of the Zambesi is said to be sacred to the Matabele.

There are also superstitions connected with fire. Mr. Mackenzie notes that if the rains are late all fires are extinguished and relighted by the lingakas or witch doctors, who make fire with the fire drill. These doctors are still powerful among the northern tribes. One was seen at Mafeking arrayed in necklace of teeth and hung with charms. They are distinguished from the *moloi* or wizards as practising white instead of black magic.

Some moloi were found in 1885 trying to bewitch the boundary line between the Bakwena and the Bamangwato. The latter made them swallow the liquor they had brewed, and with which I believe the boundary cairns were to be wetted. The unfortunate wizards died of their own poisons.

Mr. Mackenzie mentions the "digging of the garden of rain" a heathen ceremony. Charmed seed is planted in the corner of a garden before the sowing begins and the lingaka mount to the hill tops, blow horns and light fires and whistle and shout to bring the rain. They objected that the church bells of Kuruman kept away the rain. Sir Charles Warren on the other hand is held always to bring rain with him, and the rains were more plentiful in 1885 than for several previous years.

When the garden of rain has been sown it becomes unlawful to fell trees save at dawn or sunset, and a grave offence to bring a green bough of the Hackthorn (*Acacia detenens*) into the towns by day during the rainy season.

The lingaka (pl. of ngaka) receive presents of oxen in recompense for their labours. They are robed in baboon skin, and may sit on hyena skins. Children are frightened by being told that the moloi come unseen by night riding the hyena to carry them off. Among other unlucky things is the calling of a lion by his name Tao; he is called "the boy with the beard."

As regards birth, marriage and death, I have gathered little beyond what has just been said. There is a ceremony of

purification after childbirth. Levirate marriage exists as among the Zulus, and exogamy seems the common practice resulting in a great mixture of tribal relations. The successor is the eldest son, I believe, in all cases save that of a chief, when "the son of the great wife" succeeds. The great wife may be declared at any time before death. Her son is not of necessity that of the chief. Thus Moshette, by native law, is senior to Montsiwa, being his nephew, son (by law) of the elder brother. I gather however, that Moshette was son of the widow only of the elder brother, and of a common man whom she married some years after the chief died. It is not considered proper in Bechuana society to speak of such a second husband, and the first child of such an union is always supposed to be the heir of the chief. As far as I can gather, this law does not apply to any but chiefs of tribes.

Polygamy and the paying of dower for wives do not seem to be customs attended with any great evils among the natives of Bechuanaland. All the women are married, and I fear it might be said that all (save those influenced by the missionaries) are as unfaithful to their husbands as are the husbands to their wives. As regards dower it should be noted that it forms a sort of marriage settlement. If a husband unjustly sends back a wife to her own people, she receives the cows paid for her as her portion. If she is justly divorced the cows are returned to the husband. The cows for the first wife are provided by the bridegroom's father: those for a second he has to get by his own exertions. A marriage "on credit" is however often possible, one or two cows being paid on account, the rest as the husband gets richer.

If a woman have an illegitimate child before marriage, the father pays so many cows, which when she marries are deducted from her dower. The native mothers are, however, vigilant, and in the old native society illegitimate children before marriage were few.

As regards burials, the chiefs I am told are sometimes buried vertically with bow and arrows and calabash of water. There are no sacrifices at burials, but pottery is broken by the widow over the grave. This I find is also a Chinese custom. No cemeteries are found near towns, for the grave is hidden. In some cases chiefs appear to be buried in their cattle kraals. These seem to be sacred places, and women are not allowed to enter a kraal while the cattle are in it. Among Zulus the spirits of dead chiefs inhabit serpents near their tombs, but this I have not heard of among the Bechuana tribes. Widows and widowers remain in huts outside the village, as being impure for a certain time after the death.

Polygamy is said by missionaries to be decreasing, but this (except among converts) may be due to the decreasing prosperity of the tribes. Formerly, a man became richer the more wives he had, because they used to hoe his mealies. Now, however, ploughs have been introduced and the men take pride in driving a team of eight oxen in a plough. They are also proud of their wagons of sixteen oxen. The women are therefore less active in agriculture. It used to be a common sight to see a company of women hoeing a field, advancing in a line and singing in the intervals of labour. I have, however, very rarely seen women hoeing mealies.

The Bechuana system of government is somewhat akin to constitutional monarchy. The chief has certain counsellors representing each a village or section of the tribe, and each the head of a local council. The younger or less celebrated members speak first: the chief sums up. His decision is much influenced by the opinions of the counsellors who represent the popular wishes; but there is no voting and his decision is final. A good chief finds his tribe continually increased by families which desert the station of a cruel or incompetent ruler. The great fault of the system seems to lie in the power given to the chief, since, if a chief takes to drinking—which is too often the case—disorganisation and ruin ensue among the tribesmen—as in the case of the Batlaping, whose chief, Mankoroane, has illegally signed away the lands of his people, under the influence of drink given to him by white speculators.

The land laws are simple. The land belongs to the chief. He divides it among his head men, and they in turn among their people. There is no division of grazing land. The mealie fields are practically the property of their cultivators so long as they are tilled. I found each patch to belong to an individual, and to be divided generally by untilled land from the next patch. The fields have to be left fallow every third year at least, as the crop exhausts the soil, no manure being used. A chief can only legally assign untilled lands to new members of the tribe, whether white or black. The law as to theft is also very practical. The whole village is responsible. The head man must assist the person robbed, and the responsibility can only be evaded by proving that the spoor (for it is generally a case of horse, cattle, or wagon theft) extends beyond the village lands to those of another village. Thus the whole tribe becomes interested in detecting the thief.

As regards punishments I gathered nothing, but it is certain that white men have even been tried for their lives before Baralong chiefs. As a rule the legal and political proceedings of the Bechuana are remarkable for a love of justice and fair

play, not always found among races higher in the scale of civilisation.

Native trade in Bechuanaland has now been ruined by the incursions of the white races. The evidence taken before a committee of which I was a member showed that before 1880, the Batlaping and Baralong carried on a considerable trade with Kimberley and Barkly in wood, skins, corn, and mealies. Even the Makalaka travelled south to work in the diamond mines until they had earned the price of a wife, and I have seen poor natives on their way to Kimberley, their only provision being a bottle of water. The trade is now extinct, and even the employment has fallen off through the misfortunes of the mining companies.

There is a good deal of hospitality between the tribes. Thus, the Batlaping, who were starving at Taung, went with their families in 1885 to visit Mafeking when the Baralong had a good harvest. These visitors were fed for a month and sent home with bags of mealies in their wagons.

The use of European clothing has become usual among the Bechuana, even up to the most northern part of the Bamangwato country, but in the small outlying villages the women still wear karosses, and carry their small naked children on their backs, tucked up in the skin. They commonly tie a bright handkerchief over their heads. In Mahiking the women wore print gowns and tartan shawls, and the men often wore the knitted bonnet of the Scottish lowlanders. Among the Batlaping, I am told the women continue, even under their skirts, to wear the heavy rows of beads round their waists; and they wear beads round their ankles looking like blue socks. There is much variety in fashion. One year all the women wear blue beads, but on another (perhaps just when a trader has laid in a stock of blue beads) the women all refuse to wear any colour but yellow. Just now very small black pot hats are worn by the men. Some years ago, huge felt hats, like that of Rip van Winkle, were in fashion. The stores are full of these hats now unsaleable. The children wear no clothes, but the girls have a fringe of leather reaching to the knees, and the boys a little skin apron.

I should note that the peculiar straw hat of the natives is still worn by men in some parts of the country. It is of very small size, like that of a Swiss woman, but much smaller. Sometimes it is even worn by young dandies set well on one side of the head.

The Bechuana are said to differ from the Zulus in living together in large towns with a few outlying villages or cattle-posts, instead of being distributed in many villages of smaller

size. Kunana, the largest of the native towns which I visited, contains perhaps 2000 huts, all of about the same size and all of one plan. The native hut is round, but sometimes a horse-shoe shape is now used, and square buildings erected in imitation of the white man. The roof is of grass on rafters of branches resting on a rough centre pole. The Barolong huts are much better built than those of the Batlaping; they are made of sun dried bricks covered with red mortar. The Batlaping use a sort of wattle of stakes and mud. The Barolong in the north make mudwalls to the yards, the Batlaping use scarrums of brushwood very neatly constructed to keep out the sand of the dust storms. The Barolong huts are very clean inside, and Mahiking, among its green trees and rocks, is a clean as well as a picturesque town. The towns of Kanya and Molepolole are still more picturesque, but, I understand, very dirty. In these towns a trader's house or tin shed may always be seen, and generally there are several.

The native fortifications consist of stone krantzes or walls, generally on the sides of Kopjes. We found Mahiking so fortified and Kunana as well; and the old krantzes of Chaka's time have been already noticed in this paper. These walls are thoroughly effective in absence of artillery fire. The native word for such defences is Litaku or "walls." It is curious to note how complicated some of these systems of walls may be made, allowing of desperate resistance after the fashion of street fighting even if the enemy should gain the first line of defence.

The towns are, however, in native estimation, still better defended by the charms of the Lingaka. Mr. Mackenzie mentions in his interesting work, "Ten years North of the Orange River," that *lipeku* or charms are placed on the roads outside the towns. These are generally horns of antelopes set up. This may perhaps only apply amongst Bamangwato, whose sacred animal is the antelope, *puti*. The *lipeku* ox is also sacrificed, being prepared some time previously by having its eyelids sewn together.

The Batlaping are perhaps the most degraded tribe of the Bechuana, and are despised by the Basuto who are more warlike and independent. Indeed, the Basuto are as yet an unconquered people. Nevertheless the Batlaping also can fight desperately as was shown by their refusal of the terms of peace offered, I am told, by Sir C. Warren, and by their subsequent desperate resistance at Takun or Litaku, a place named from its stone walls.

The Bechuana are now in possession of European fire-arms. The Barolong have a few good rifles—express or Westley-

Richards—but not always the necessary cartridges. I have seen them parade with an extraordinary assortment of guns, from an elephant gun downwards. Some were the proud possessors of a cartridge belt for some sixty rounds, containing, however, only perhaps a single cartridge.

The old native arm was the *chaka*, or battleaxe. They never possessed swords, I am told. The shield was an oval of 18 inches by 12, not the long shield of the Zulus and Matabele. The use of bows and arrows among the bushmen, in the western part of Bechuanaland, still continues. The arrows, I learn, are poisoned with the milk of the spurge (*Euphorbia*), or by being left in decaying animal matter, or—according to others—by the poison of snakes. The arrow has a long and fine iron blade, sharp as a razor. The varieties of native arms may be studied in Mr. Mackenzie's book above mentioned.

Turning from war to the chase, it may be noted that among the Bangwaketse and other more northern tribes, the *hopo*, or game trap, described by Dr. Livingstone, is still in use. I found old game pits further south, but near Korwe (a place named from the hornbills which abound in the vicinity) I found one recently prepared. Game is gradually disappearing south of the Molopo, though it is still abundant in the west and north. The lion still occasionally ranges as far south as Taung (a place perhaps named from this beast), and the spotted cheetah is still common in the west, but the elephant and the giraffe are not found in the new colony. The wildebeest, hartebeest, quagga koodoo, stein-buck, duiker, riet-buck, gems-buck, springbok, blesbok, and occasionally, I believe, the rooibok (pala) are still found in numbers in the less frequented parts of Bechuanaland. The *hopo* which I saw consisted of forty pits arranged in fours, the length of the trap being in the direction of the drive, which was cleverly constructed of thorns—a sort of hedge not conspicuous, but difficult to pass. The pits were 3 feet by 4 feet, and 4 feet deep, with narrow ridges between. I am told that a cavalry horse was disabled, in another part of the country occupied by the expedition, having been ridden into a buck pit during a hunt.

Bechuana society may be considered to consist of four grades beneath the chief. The rich men—sons of chiefs or counsellors—generally of the chief's family, live in the native towns and possess herds of oxen, mealie fields cultivated by their retainers, and wagons driven by their servants. Beneath them comes the agricultural population, also living in the towns, engaging in trade and in native manufacture. The herdsmen, who keep the herds at the cattle posts, are again a lower class, and the poorest are the Makalahari, who are nomadic hunters, living chiefly in the

west, and considered in the light of serfs of the chief. These Makalahari are, in condition, similar to the bushmen, but the true bushmen are not Bechuana, but Hottentots, or akin to the Hottentot, judging from the linguistic evidence. Even the Batlaping still claim authority over bushmen living on the borders of the Kalahari Desert.[1]

The chief native manufactures are in leather and in metal. The native smiths are said to be skilful. They use a bag bellows, like that used by gipsys all over the world, which I have seen in Italy and in Syria. They draw copper through holes in a stone to a fine wire. I have, however, never come across any smiths. The Mashona, living in a metalliferous region, north-east of the Matabele, are famous for their metal work, and for the copper ornaments of the women. In the south, Europeans are now employed to mend the ploughs and the wagons of the natives.

The manufacture of karosses continues to be one of the great industries of the Bechuana, and these skins are retailed at a high profit by traders in Kimberley market. The tiger skins are brought from the north, but deer skins, blesbok, koodoo, or more commonly springbok, may be obtained anywhere. Jackal skins and cat skins are among the softest. The skins are suppled in milk, they are tanned with mimosa bark, and the sewing is remarkably neat, a button-hole stitch being used (as I am told by Mr. Ashton) the sewing material being a fine sinew of the animal. Every shot hole or spear mark is carefully patched, and this is often so well done as to be invisible on the outside. Sheepskins are also made into karosses, and form excellent beds. It is usual to wear the needle used in sewing karosses suspended round the neck, in a wooden case as an ornament.

Stone implements in South Africa seem to be chiefly represented by the "bushmen stones," which have often puzzled explorers, being found in deserted settlements. It appears to be thought that these were used as weights on the sticks or stakes used by the bushmen in digging for roots, but they do not seem to be now in use. The stone is globular, and the perforation is shaped so as to be smallest in the middle. This may perhaps result from being bored on both sides.

As regards education, considerable progress is made by individuals. Schools have been established by missionaries, and appear to be well attended. A native newspaper has long been published at Kuruman. The nephews of Montsiwa were able to speak, read and write English, and even to understand a map, and draw a rough plan of the roads, with names of places

[1] Bushman pictures are to be found in Bechuanaland, east of Vrijberg, but I was unable to visit the spot.

written in English characters. I have no doubt that their education extended even further, but confine myself to personal observation. The sons of Sechele, I am told, have even composed hymns in their native tongue, but this has not prevented them from falling into habits of intemperance. They were educated in Cape Town, but a native can now receive an elementary European education even at Shoshong. Dutch is more spoken, however, than English, especially by the natives near the Transvaal, but there are many natives who can speak the three languages—including their own.

Native children are a cheerful race; and indeed, in spite of war and famine, the Bechuana are a cheery people, always ready to laugh and sing, and easily forgetting their troubles. The children do not appear to have many regular sports, but are found in every village riding on sticks or cracking whips. They also make little toy huts and kraals; and one officer brought back a small ox made of clay and very fairly formed. These oxen they place in their miniature kraals.

One of the last questions in the text book which I have followed, relates to conservatism and variation. Concerning this, I may say that the natives of South Africa, like the Arabs, are by no means blind admirers of civilisation. They have their own opinions, both as regards individual white men, and also respecting individual white customs or inventions. They regard their own customs generally as being best fitted for themselves, but are willing to accept such improvements as commend themselves on the score of utility. Thus, the wild Bedawin of Syria have adopted firearms, cigarettes and matches, but have not taken to European clothing, or to tall hats. The Bechuana have adopted ploughs, wagons, firearms, hats and European clothing, also brandy, and gold, silver or copper coins. On the other hand, they are attached to their old system of land tenure, and do not always desire to be converted into individual independent farmers under government. Neither do they always recognise the superiority of the Christian religion over their own cruel and stupid superstitions. Nor again do they desire only to have one wife. They regard the payment of dower as a mark of respectability; and the physique and morality of the race—though the latter has never been good—have deteriorated, in consequence of the loss of self-respect and of the decay of the native system of society.

In conclusion, I would venture to assert that our present treatment of the native race in Bechuanaland reflects little credit on us as a nation. It is true that we do not—until attacked by the natives—destroy their villages, nor do we shoot their women and carry their children captive as the Boers

still do, but the native outbreaks are, as a rule, the result of oppression and injustice on the part of white men. Starvation and the illegal seizure of native lands are, perhaps, slower, but not more justifiable, methods of securing that retreat of the black man before the white which Colonial politicians seem to regard as a mysterious action of natural law.

Were such action followed by material development of the resources of the country, we might perhaps regard the result with more satisfaction, but Lord Wolseley was certainly right in saying, only the other day, that the Boer is little above the native in the scale of civilisation. He is, indeed, in some cases lower, for he does not, like the Bechuana, desire improvement, and the extension of trading operations. Were it possible for independent Englishmen to take up the settlement of native questions, on the basis of equitable recognition of all claims irrespective of race, we should, I think, hear little of native outbreaks: and if the Bechuana chiefs were supported in their attempts to keep brandy out of their towns, we should not have to chronicle the final disappearance of the race of which I have thus offered you a slight contemporary sketch.

Discussion.

The Chairman (Mr. Hyde Clarke) after referring to the services and claims of Captain Conder, said that it had been an object of the former President, General Pitt-Rivers, that the Anthropological Institute like other learned societies, should in the course of its session have papers on the topics of the day. He considered that if anthropology was to be made a popular study, so also it must be shown to have its practical aspect. These meetings had been inaugurated by the late Sir Bartle Frere in the President's house in a discourse on South Africa, which was a fitting prelude to this paper of Captain Conder. It was more than possible that the observations of Dr. Bleek and others had some foundation, and that clicks, tones and intonations were connected in the origin of language, with the same causes of differentiation, which produced tones in the Chinese and Indo-Chinese languages. Such were not to be considered as having been invented by the Chinese.

Mr. Carmichael, having taken the Chair vacated by Mr. Hyde-Clarke, observed that among the various points of interest which struck him in Captain Conder's account of the Bechuana and neighbouring tribes one was that of their superstitions and folk-lore, and in connection with that topic he desired to mention, besides the Blue book referred to by Captain Conder, the interesting draft Penal Code for the Transkei, of which an account was given in a recent number of the *Cape Law Journal* (Grahamstown) for June, 1885. That code was, he thought, probably the only existing code to which we could turn for an authorised statement of the folk-lore

and superstitions (*e.g.*, witchcraft) of uncivilised races in so far as they touch upon social order. We had had, and it might be said, still had plenty of superstitions in England, and occasionally, as in the case in which William Rufus is known to have sneered at his English subjects for their superstitiousness, the facts have got on record in our history. Mr. Carmichael wished to know, with regard to the dances mentioned by Captain Conder, whether he saw any evidence of their having any astronomical connection, like the dance at the return of the Pleiades, stated to be a ceremony among the bushmen, and with regard to the expressions used concerning the whole tribe as being interested in the apprehension of a thief, whether he might take that to mean that collective responsibility was a Bechuana institution. In moving the thanks of the meeting to the reader of the paper, Mr. Carmichael referred to the pleasure which it gave him to have that opportunity of thanking Captain Conder for his valuable services in the cause of scientific exploration, of which he had, on a previous occasion heard him give an interesting account, at a conference at South Kensington in connection with the Survey of Palestine.

Mr. W. Morrison, called attention to the chiefs being darker in colour than their subjects. As a rule the governing class of a tribe were lighter, not being so much exposed to the sun. Was there any other example of the D being confused with L and R? The confusion of L and R is common in the Pacific Islands. Another example was *Lima*, which the early conquestadores wrote as *Rimac*.

Mr. Bertin said that he should like to call the attention of Captain Conder to the ethnological differences between the bushmen and the Bantus which Captain Conder in his most interesting paper seemed not to take sufficiently into account. He spoke of the Bechuanas for instance as having the hair in tufts, which is a bushman characteristic; the clicks also were, according to Bleek, Professor Keane, and others, bushman in origin. As for the tones found in Hottentot and other African languages in the South as well as in the Niger region, they could hardly be taken as a proof of relationship of two races, for we know how and when they were developed in Chinese: and, as noticed lately by Professor Terrien de la Couperie, tones were now being independently developed in Tibetan to compensate phonetical losses. Of course the intermingling of the populations was so considerable in South Africa that Captain Conder had had many difficulties to overcome in his interesting and thorough study of a race, which, if it did not pass away would, in course of time, be so completely modified that for the ethnologist and philologist it would have practically disappeared.

Mr. Chesson, after thanking Captain Conder for his interesting paper, which he said had been pervaded by a true spirit of humanity, referred to Secheli's desire to establish a prison in his territory for the punishment of criminals. He remarked that the late Bishop Colenso had informed him that Cetywayo, on the eve of the Zulu war, was meditating the introduction into Zululand of a similar

institution. Generally speaking, a savage chief, not knowing what to do with his criminals kills them, but the fact that both Secheli and Cetywayo conceived the idea of largely substituting imprisonment for capital punishment, showed a great amenability on their part to civilised ideas of justice. He was glad to hear what Captain Conder had said about the purchase of wives for cattle among the Bechuanas. He could, however, assure him that that system in Natal and elsewhere was fruitful of great evils, and that it often placed young women, whose affections were otherwise engaged, at the mercy of old and wealthy polygamists. He thought that in countries which came under British rule the system ought to be gradually abolished. With reference to intoxicating drinks, he hoped that the Bechuanas had the same power of moral recovery as the Basutos, who after having yielded to the insidious temptations of Cape brandy, and apparently lost all self-control, suddenly awoke to a sense of their degradation, and expelled the brandy bottle from their country. After referring to the cruelties of the Boers to the Korannas, and especially to the neglect of the wounded after the capture of Mamusa, Mr. Chesson thanked Sir Charles Warren and Captain Conder for the good work they had done in Bechuanaland.

The Rev. J. Mackenzie, expressed the great pleasure which he felt in finding an assembly of learned men in London discussing the subject of Captain Conder's paper. And he was especially gratified with the clear manner in which Captain Conder had put together the observations contained in his paper, which abundantly proved that he was both an able and a trained observer. He might be allowed to supplement, or explain further, one or two matters. In Bechuanaland the cattle paid by the bridegroom under native law to the bride's father was the only way in the olden time of establishing the validity of the marriage and the legitimacy of the children. Without the payment of cattle the father could not establish before natives that the children were his. But Christian natives were getting accustomed to the marriage register in the native church as a still better proof of marriage, of the consent of the father-in-law and other relatives, and of the legitimacy of the children. The morality of mission stations was higher than that of the heathen towns; only cases of immorality were observable in the former, while unnoticed in the latter. There was no point to be made out in favour of the English as such or the Boers as such. The difference was one of education; the stock or race was one and the same. It was as if two sons of the same parents had chosen different courses—one remaining among educative and civilizing influences, while the other shouldered his rifle and went into the wilderness. It was quite true that so far as we knew there were not 200,000 people in Bechuanaland from the Cape Colony to the Zambesi. And yet in some parts of the country natives might suffer hardship through loss of their cultivated lands. But under wise administration and control it was certain that there was land in Bechuanaland not only for the natives but for a considerable

population of Europeans also; and the advantage to all parties would be very great if the English Government assumed the management and control of this wide area of unoccupied land. The question had just been put if it was absolutely indispensable that strong drink should be sold at Mankorrane's town. He was not aware of any necessity for this. The Administrator was free to decide either for or against it. The law in the new colony on the whole was that of the Cape Colony. But there was no colonial law compelling the sale of liquor or the licensing of canteens, although such houses might be legalized under certain restrictions. It was not according to colonial practice to issue a licence to sell drink within a native town. In the Free State they had no canteen licences whatever. If nothing but ginger beer were for sale in Taung the missionary would not have attended the licensing court to protest against the issue of the licence, nor would the magistrate, the son of Dr. Moffat, have thought it necessary to explain that in this matter he had consulted the Administrator and that the licence to sell spirits in Taung was issued by the desire of the Administrator himself. At the same time he would not have them believe that the Bechuanas were a drunken people, or that natives generally were dying out in South Africa. This was not so, from all the information which he could obtain. Although the natives had no large idols as in other countries, they had smaller fetiches which they wore or placed in their dwellings, and in which they trusted. They believed in the after-life of man, and were ancestor-worshippers.

Sir GEORGE CAMPBELL, and Mr. C. ROBERTS also joined in the discussion.

Captain CONDER, in answer to the questions raised in discussion spoke as follows:—The dances to which I alluded are not of certain antiquity; I do not think they have any discoverable astronomical origin. Both men and women moved round, not with, but against the sun. As regards the size of the chiefs (to which Mr. Morrison alluded) the chiefs are generally much stouter than other natives, chiefly, I suppose, because they are better fed. As regards the word Turanian, I wish to say that I used it in the present restricted sense as referring to the Altaic race which is certainly known to have existed in Babylonia as early at least as 2,500 B.C.

I am, of course, aware that the Bantu Hottentot races are quite distinct. It is possible that the tufted hair of some of the Bechuana may be due to an admixture of Hottentot blood.

The chief questions raised in discussion referred to trade, sparsity of population, drink and disease, and to the treatment of the Korannas by the Transvaal Boers. I think that there is a good deal of misapprehension in England on each of these questions which affect the future of the natives of Bechuanaland.

As regards trade, that of the natives has ceased entirely since the incursions of the filibusters from the Transvaal; and the Batlaping having been deprived of all their best lands are now not only without the means of carrying on such trade but even without the means of subsistence. The white trade with the interior was

almost entirely in the hands of Englishmen. This also has been much injured by the filibustering incursions, but may revive. That of the Batlaping natives is, however, quite ruined.

As regards sparsity of population the natives are collected in towns chiefly. There is much fertile land capable of cultivation if wells, cisterns, and water furrows were made. This the natives have never learned to do. There would be plenty of room for both whites and natives if the latter were allowed to retain their cultivated lands round the natural sources of water supply, but from many of their lands they have now been driven off and are over-crowded on the small remaining part of their original lands.

It is quite certain that Cape brandy is now being very largely consumed by the natives within the Crown colony. The rule of Montsiwa, Kama, and other chiefs was formerly so strong that the white traders did not dare to deal in spirits as they would have been expelled and would have lost all their other trade had they been found to deal in spirits. The drunkenness of the southern tribes is far more general than that among the northern.

The disease to which I referred (syphilis) is fearfully prevalent among the Mari Batlaping. It is also wide-spread among the Batlaping of Taung. In the north among the Barolong, it appears less general. It is generally attributed to the white people. The congenital diseases of the children appear to be such as would result from the parental syphilis, and these congenital diseases are said by old residents to be much increased. The climate is very healthy, and is specially recommended to consumptive Europeans so that the lung diseases do not seem to be due to climate.

The treatment of the Korannas by the Boers during the present year is notorious. This is, however, a political question. Moshette, the Barolong chief at Kunana, is said to be already marked out by the Boers as a victim, and the future treatment of this chief should be noticed by those who may feel interest in the question.

It was not my intention, however, to do more than refer to well-known facts in the recent history of the Bechuana in a paper of a scientific character.

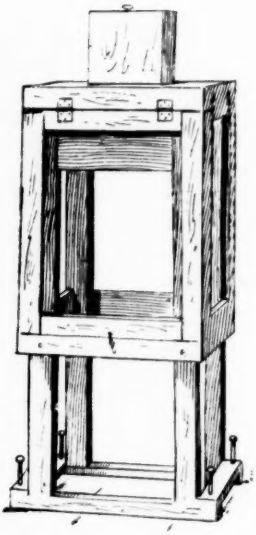

FIG. 1.

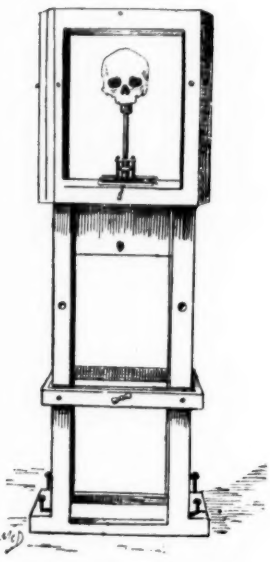

FIG. 2.

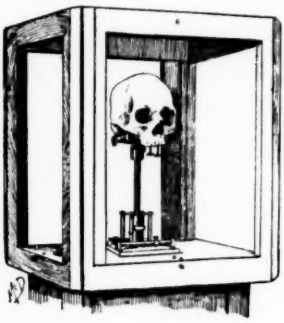

FIG. 3.

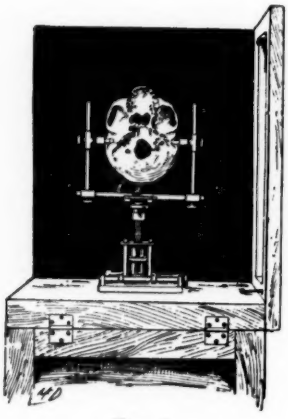

FIG. 4.

NEW CRANIOPHORE OF DR. BILLINGS AND DR. MATTHEWS.

ANTHROPOLOGICAL MISCELLANEA.

On a New Craniophore *for* Use *in* Taking Composite Photographs *of* Skulls.[1]

By John S. Billings, M.D., U.S.A.

[With Plate II.]

At the meeting of the National Academy of Sciences in April, 1885, I described an extemporized contrivance for taking composite photographs of skulls, and announced that the construction of a more convenient apparatus was in contemplation. Such an apparatus has since been constructed, under the direction of Dr. Washington Matthews, U.S.A., and has been employed by him in taking a number of composite photographs of crania.

The apparatus itself, of which figures are presented in Plate II., consists of an object stand, with four hinged frames, and a craniophore, with two different attachments for holding the skull.

The object stand (fig. 1) is of walnut, 3 feet 5 inches high. The top is 18 inches square and 2 inches thick, with a hole in the centre, through which the main screw of the craniophore descends. Four frames, bearing fine cross wires, are attached to the top by hinges in such a manner that they may be raised and lowered.

The craniophore (fig. 2) is of brass. It has a large screw, to elevate and depress the skulls. This screw is worked by means of a long tubular nut, fixed on a frame. The latter slides on two round bars, and is moved by a smaller screw, which works in nuts fixed to the bottom of the frame, and secures thereby lateral adjustment. On the summit of the screw is a ball and socket joint. In the top of the ball is a hole, or well, which receives the pin at the base of each attachment, and thereby holds the latter in place.

One attachment (fig. 3) is for supporting the skull, base downward, when the facial, lateral, and occipital views are taken. It has a cone, which enters the foramen magnum, and a jointed arm, elongated telescopically, which supports the palate.

The other attachment (fig. 4) is for holding the skull when the basal and vertical views are taken. It has two arms extending horizontally. On each of these is a vertical bar—moveable, in order

[1] This article is reproduced, by permission, from "The Photographic Times and American Photographer," of New York, for January 15, 1886; and the illustrations forming Plate II. have been obligingly contributed by the editor of that journal.

that skulls of different widths may be accommodated. On each vertical bar is a short horizontal, obtusely pointed bar, which fits into the auditory meatus, and moves freely on the vertical bar. These moveable parts are provided with binding screws. The horizontal bars are attached to a plate which slides on a frame; this arrangement secures the antero-posterior adjustment necessary to insure coincidence of the selected horizontal plane with the lateral vertical wires.

To operate: The skull is placed in the desired attachment; the latter is secured by the pin at its base to the ball in the joint. The joint is tightened by its screw to such a degree that it will move by gentle force, but not by the mere weight of the ill-poised skull. The frames are raised and maintained in their upright position by hooks fastened into eyes on the top of the table. The skull is adjusted on the four sets of cross wires. Then the anterior frame and the lateral frame next to the window are lowered; a black velvet background is hung on the posterior frame; a large white cardboard is hung on the frame further from the window; the brass-work is occluded with small velvet screens, and the picture is taken. When the work of the day is done all the frames are folded down, fastened by buttons to the legs of the table, to secure them from injury, and the craniophore is covered.

Explanation of Plate II.

Fig. 1. Object stand for the craniophore of Dr. Billings and Dr. Matthews.

„ 2. Craniophore on stand with the folding frames raised.

„ 3. Arrangment for supporting skull when photographs of the facial, lateral and occipital views are taken.

„ 4. Arrangement for supporting skull when photographs of the basal and vertical views are taken.

On American Family Peculiarities *in the* 18th Century. By the Rev. Jonathan Boucher.

The following extract from the unpublished autobiography of an observant and well informed settler in America upwards of a century ago, has been communicated to me by Mrs. Arthur Evans, of Oxford. It deserves publication on account of its intrinsic interest, and because it may induce American anthropologists to inquire how far those family peculiarities that were so evident to Jonathan Boucher, may through prepotency or perhaps in some rare cases through a continuance of family intermarriages show persistent traces down to the present day.

Francis Galton.

Extract from the AUTOBIOGRAPHY *of the* Rev. JONATHAN BOUCHER.
(Unpublished.)

"Americans, in general, I have thought eminently endowed with a knack of talking. They seem to be born orators. I remember a whole family (of the name of Winslow, in Hanover county) who were all distinguished as speakers; and so were the Lees, and many others. And there is this further peculiarity observable in those countries, that the first settlers having usually taken up large tracts of lands, these have since, from time to time, been divided among and allotted to their descendants in smaller portions; so that by this means, and by intermarrying, as is very much their custom, with one another, certain districts come to be settled by certain families and different places are there known and spoken of not as here, by any difference of dialect (for there is no dialect in all North America) but by their being inhabited by the Fitzhughs, the Randolphs, Washingtons, Careys, Grimes, or Thorntons. This circumstance used to furnish me with a scope for many remarks, such as do not so often occur here. The family character, both of body and mind may be traced through many generations, as for instance—every Fitzhugh has bad eyes, every Thornton hears badly, Winslows and Lees talk well, Carters are proud and imperious, and Taliaferros mean and avaricious, and Fowkes cruel."

Jonathan Boucher was born at Blencogo in Cumberland, March 1, 1738.

In 1759 he went to Port Royal, Virginia, where, as well as in Maryland, he held various livings until in the year 1775 he was forced to fly from America. He then held a curacy at Paddington, and finally the living of Epsom, where (I believe) he died.

See also *Gent. Mag.* June, 1804, and Chalmers *Biog. Dict.*, also "An American Loyalist," *Notes and Queries*, 3rd Series, ix., 75, 282; 5th Series, i., 102, v., 501, vi., 81, 141, 161.

ROMANO-BRITISH MOSAIC PAVEMENTS.

Those anthropologists who include archæology within the range of their studies may be glad to have their attention directed to a work on "Romano-British Mosaic Pavements," by Mr. Thomas Morgan, F.S.A., recently published by Messrs. Whiting and Co., of Sardinia Street, W.C. The author has not only collected within moderate compass the scattered notices of these interesting relics of ancient art, but has introduced into his work much original matter. The numerous tessellated pavements of Britain are described in topographical groups, county by county, beginning with the well-known example at Woodchester, in Gloucestershire, and ending with the fine pavements unearthed by Mr. J. E. Price

and Mr. F. G. H. Price at Morton, near Brading, in the Isle of Wight.

The mythological significance of many of the subjects represented in the mosaics of this country is discussed with much fulness. The popularity of mosaic decoration among the Romans became so great that in the time of Seneca he was considered a poor man who could not afford a tessellated floor. *Tesseræ* and *sectilia* were imported into this country for the purpose of carrying on the manufacture. Glass, though occasionally introduced into our work, was but sparingly used, while in the African and Asiatic mosaics cubes of vitreous materials were largely employed.

Not the least attractive feature of Mr. Morgan's work is the series of admirable engravings by which it is illustrated. Many of these are exceptionally fine examples of colour-printing, the more notable being copies of the Woodchester, Bignor, and Morton pavements. Several mosaics from Asia Minor and North Africa, now in the British Museum, are also well illustrated.

An appendix to the work gives the text of the *Itinerary* of Antoninus, so far as regards Britain. This is accompanied by a map presenting a general view of the directions of the roads by which the Roman engineers connected the main ports and fortresses. Some of the finest specimens of mosaic, as might be expected, have been found along these roads, and it is likely that in their vicinity other mosaics may, in the course of time, be brought to light.

The most numerous examples of mosaic pavements have been furnished by the south-western counties. Mr. Morgan believes that remains of many mosaics may still exist beneath the early religious houses in this country. "The Roman pavements had, of course, to be done away with on account of the allusions on their face to the old mythological worship; but it is probable that if we were to dig beneath the old tithe-barns of the monasteries, which are often extensive and well preserved, we should find that they were not unfrequently built over mosaic pavements of old Roman times; for this reason, that the hypocaust below them, and their solid construction, rendered them impervious to damp, and therefore well adapted for granaries; and they seem to have been used as such in the middle ages, from the frequent remains of wheat found upon the surface of mosaics."